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Adams, Karen K NAE

From: Walter Brooks [wb@escape.com]
Sent: Sunday, November 21, 2004 6:51 PM
To: Energy, Wind
Subject: The Patriotic thing to do for our service men & women
Importance: High

U.S. Army Corps of Engineers, New England District - Cape Wind Energy EIS Project
Attn: Karen Kirk-Adams
696 Virginia Road, Concord, MA 01742
wind.energy@usace.army.mil

Dear MS Kirk-Adams,

My family's roots go back to the 1640's and the first eight settlers on Cape Cod. Most of my family members were born here and still live and work here.

We are all strongly in favor of the Cape Wind project, and for these "clean dozen";

1. I founded a vacation magazine network here in 1988 which is today the largest such group in America (see <http://BestReadGuide.com>). In launching fifty editions from Alaska to Cape Cod and from Maine to Florida, I have had more first-hand experience with tourism marketing than any other Cape Codder, and I KNOW that a wind farm is good for tourism which remains the cape's #1 business. The wind farm in Palm Springs where I launched an edition is a quarter-century long proof of the above.
2. I have two grandchildren, both born on Cape Cod. I endorse the wind farm so their future may be free of imported oil.
3. My home overlooks Pleasant Bay in East Harwich. Tiny "masts" six miles offshore wouldn't bother me nearly as much as another World Trade Towers disaster.
4. I endorse the wind farm to protect our beaches from another oil spill.
5. I endorse the wind farm because it is good for Cape Cod and vital for America.
6. I endorse the wind farm because Cape Codders have always been pioneers ever since cape sea captains became America's first revolutionaries in 1775 sailing their ships against the British crown as privateers a year BEFORE Lexington & Concord.
7. I own a catboat and sail Nantucket Sound, and I stay away from Horseshoe Shoals like any wise mariner. I can't wait to sail past this beautiful "kinetic art".
8. If our ferry captains can't avoid hitting turbine towers, they should be replaced by navigators who pay attention. There are hundreds of ships, shoals and buoys for them to avoid as well. That's like not having electric power poles along our roads because someone might hit one. And if planes flying into Hyannis airport can't avoid wind turbines, we'd better stop them flying near the Provincetown Monument to say nothing of the Empire State Building.
9. There is more NON-degradable oil in the dozen marinas and the thousands of commercial and pleasure boats plying the sound than in Cape Wind's supply platforms, and CW's oil IS biodegradable.
10. I endorse the wind farm in hopes of cutting down the pollution from Brayton Point coal-fired power plant as well as the oil-fired Mirant Canal Plant which is a thousand times uglier than all the wind turbines on earth.
11. I endorse the wind farm because I trust the common sense and professionalism of the U.S. Army Corps. of Engineers.
12. I endorse the wind farm because it's the patriotic thing to do while our sons and daughters are dieing for us to protect the Iraqi oil fields.

Sincerely,

11/23/2004

Walter Brooks, Editor & Publisher,

Best Read Guide, Cape Cod TODAY, & eCape.com

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Magazine site: <http://CapeCodTRAVEL.com>

Media Column site: <http://CapeCodMEDIA.com>

Tourism Network site: <http://BestReadGuide.com>

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Adams, Karen K NAE

From: Steve Mahoney [mahoney@norwellschools.org]

Sent: Monday, November 22, 2004 10:11 AM

To: Energy, Wind

To whom it may concern,

As an educator and as a citizen I strongly support establishing alternative forms of energy production. As such I fully support the proposal to construct a "wind farm" off the Cape Cod coast. Failing to move forward with the Cape Wind project would be a disastrous decision. The economics, science, and politics that support the wind farm proposal make the decision to move forward appear automatic.

For too long small, wealthy, and self-interested groups have blocked the creation of sensible, sustainable, and environmentally sound forms of alternative energy. The Cape Wind proposal should move forward.

Sincerely,

Stephen R. Mahoney, Principal
Norwell High School
781.659.8810
www.norwellschools.org/hs

11/23/2004

Adams, Karen K NAE

172

From: Dick Farrar [farrar@manainc.com]
Sent: Tuesday, November 23, 2004 8:54 AM
To: USArmy Corps of Engineers (E-mail)
Subject: Wind Farm

Put me down in the column as needing more time to go through the DEIS on the Nantucket Sound Wind Farm. The information is massive and won't allow me in my spare time to do it justice in the next couple of months - Holidays included. Please extend the comment period.

Dick Farrar
Falmouth

11/23/2004

Adams, Karen K NAE

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From: SteveNadis@aol.com
Sent: Tuesday, November 16, 2004 10:06 PM
To: Energy, Wind
Subject: Cape Wind Project

To whom it may concern,

I'm writing this letter in support of the Cape Wind project. We need to develop clean energy sources in this country. Every power plant has some drawbacks, but the drawbacks of this project pale in comparison to the negative impacts (with respect both to air quality and greenhouse gas emissions) of the fossil-fuel-burning plants now used on the Cape and throughout the state.

I vacation frequently on the Cape and Islands but am not worried about having my views spoiled. In fact, concerns about the visual impact have been consistently exaggerated. (I might feel differently about an offshore oil rig, but for me seeing a non-polluting power plant would be a comforting sight. That said, I should note that few people will actually see the wind farm anyway, given its distance from land.)

People claim to support renewable energy sources but balk when it comes to putting anything in their own back yards. This project has proceeded responsibly and represents an important step forward for the nation's energy future. I endorse it without reservation.

Sincerely,
Steve Nadis (tel. 617 876 7143)

P.S. I'm a science writer based in Cambridge, MA. My articles have appeared in Nature, Scientific American, Science, and other journals. I have been a research fellow at MIT and have consulted to both the Union of Concerned Scientists and the World Resources Institute.

11/23/2004

Adams, Karen K NAE

From: Dave Korn [DKorn@cadmusgroup.com]
Sent: Tuesday, November 16, 2004 10:10 PM
To: Energy, Wind
Subject: support of wind project
Importance: High

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I am strongly in favor of the wind project because it provides clean power and because it can reduce our dependence on foreign sources of energy. I believe that the benefits the project brings to the residents of Massachusetts greatly outweigh any minor aesthetic impacts.

David Korn
133 Crescent St.
Stow, MA 01775
978-897-3658

11/23/2004

Adams, Karen K NAE

From: Chaz Healy [chazhe@yahoo.com]
Sent: Tuesday, November 16, 2004 11:19 PM
To: Energy, Wind
Cc: info@capewind.org
Subject: Cape Wind

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Good Morning:

I am writing to you with my continued support for the wind farm in Nantucket Sound.

As a mobile, technical society, we must seek out and promote ALL alternative means of energy. Not only to cut our dependence on imported oil (that our GI's partially are fighting for), but to leave a legacy of clean air and water for our children and their children to enjoy. Not only would this new source of renewable energy but clean, it would eliminate any possibility of another oil spill like the 2002 spill in Buzzard's Bay.

I respect the opinions of the opposition, but don't believe that their argument is strong enough to cancel this most important project.

All of my in-laws have been residents of Mashpee for over forty years and they approve this project as well.

I'm hoping to hear reinforcing news from your agency. Thank you for your considerations.

Chaz Healy
899 Auburn Street
Bridgewater, MA 02324
(508) 345-8832

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11/23/2004

Adams, Karen K NAE

From: zach lyman [zledo@yahoo.com]
Sent: Wednesday, November 17, 2004 12:31 AM
To: Energy, Wind
Subject: Writing in support of the Cape Wind project

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To Whom It May Concern,

I am writing in support of the Cape Wind Project on Nantucket Sound.

It is my belief that this project will become the benchmark for future wind development in federal waters, so it is nice to see the intense debate and in-depth research going on.

Opponents of this wind project worry about the environmental impact to the Sound. As a lifelong sailor who spent every summer in that area, I share those concerns. However, I believe that the Cape Wind project is the single best way to address my own worries about the environment.

There are definitely environmental and visual impact issues with wind development. Obviously, we need clear consistent criteria for this kind of project. Not every site should be packed full of wind turbines just because there is wind potential.

With any energy production, I am constantly reminded of that saying about 'a free lunch'. When it comes to energy, there truly is no such thing. All energy production has an impact. It has impact on both the community and the environment alike. The reality is that we, as a society, consume massive amounts of energy and often ignore the problems this behavior causes.

The power production that the Cape Wind Project can provide will be built in the coming years one way or another. Energy consumption in Massachusetts is only growing and will continue to outpace current generation. The question is, how will we fulfill energy demand?

Will we build more coal-fired power plants that depend on finite resources for fuel, that increase the levels of Asthma in children, and that will raise the levels of mercury in fish to dangerous levels? Hopefully not.

What are the other options? Nuclear, a natural terrorist target, that has waste so toxic it takes thousands of years to breakdown? How about Natural Gas, whose cost projections for the future are frightening and unstable?

When comparing environmental impacts on Nantucket Sound and the country at large, the differences between wind power and these technologies are obvious. What is best for the Sound, and best for the U.S., is

act? Yes, of course there is. But Wind
er gave a five year-old asthma. No one will
, coerced, or forced to bury toxic waste from
arm in their backyard. And over the next
generation the cost of wind powered electricity will
remain stable (indeed perhaps even become cheaper) and
reliable.

The real question is, will we as a nation be bold
enough to push into the future that renewable energy
can provide? Will the Army Corps of Engineers and the
project in Nantucket lead the way to energy
independence for the country? To clean air? To
national security?

I for one truly hope so, and I look forward to sailing
through the sound looking up at the project that
helped make a better world.

Thank you for the time.

Sincerely,
Zachary C. Lyman

=====

Zachary Lyman
Managing Partner
Reluminati LLC

415.336.2329
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<http://my.yahoo.com>

Adams, Karen K NAE

From: Quentin Huggett [quentin@geotek.co.uk]
Sent: Friday, November 19, 2004 12:39 PM
To: Energy, Wind
Subject: effects of wind farms on radar

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Effects of offshore
wind farms...



ATT260553.txt

Dear all,

We are managing the Strategic Environmental Assessment process for licensing of offshore energy on behalf of the British Government and felt that you may like to view this report. We would be interested to make contact with you to see if there are any potential synergies between your work and research projects that we are managing with respect to UK offshore energy. If you would like to see more of what we are doing please visit the web site that we have established for public consultation:

www.offshore-sea.org.uk

Please note that the web site is just about to be upgraded to include offshore wind energy. I will let you know as soon as it is available.

Please don't hesitate to get in touch if you have any further questions.

With best regards

Quentin Huggett

Results of the electromagnetic investigations and assessments of marine radar, communications and positioning systems undertaken at the North Hoyle wind farm by QinetiQ and the Maritime and Coastguard Agency

Martin Howard and Colin Brown

QINETIQ/03/00297/1.1

MCA MNA 53/10/366

15 November 2004

Requests for further information should be sought from:

Navigation Safety Branch
Bay 2/30
The Maritime and Coastguard Agency
Spring Place
105 Commercial Road
Southampton
Hampshire
SO15 1EG

Administration Page

Customer Information

| For QinetiQ | For MCA |
|--|---|
| Project title Electromagnetic investigations at the North Hoyle wind farm | Project title The effects of offshore wind farms on marine radar, navigation and communication systems |
| Customer organisation NPower Renewables Ltd. | Customer organisation Department for Transport, Shipping Policy 2 |
| Customer contact Stephen Bolton | Customer contact John Mairs |
| Contract number PRO032481 | Contract number MNA 53/10/366 |
| Date due 15 November 2004 | Date due 15 November 2004 |

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| Dr Stephen Spark | Captain J.P. Collins |
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| Date of issue 15 November 2004 | Date of issue 15 November 2004 |

Record of changes

| Issue | Date | Detail of Changes |
|-------|------------------|-------------------|
| 1.0 | 29 September | First release |
| 1.1 | 15 November 2004 | Minor amendments |

Executive Summary

Overview

The Maritime and Coastguard Agency (MCA) has responsibility, on behalf of the Department for Transport of the UK Government, for the safety of navigation under the International Convention for the Safety of Life at Sea (SOLAS), for the direction and co-ordination of search and rescue operations and for the prevention of marine pollution.

In this context MCA has been consulted by the Department for Transport, of which it is an executive agency, and the Department of Trade and Industry's Offshore Renewables Consents Unit with respect to assessing all foreseeable marine safety risks associated with applications made by wind farm developers.

Since no large-scale off-shore wind farms existed in the United Kingdom until the North Hoyle site was developed, investigation into their potential effect on marine radar, communications and navigation systems was necessarily limited to desk top and laboratory research. The North Hoyle development therefore presented an opportunity for QinetiQ and MCA to carry out experimental field tests for the first time in the United Kingdom, the results of which would be used to inform the offshore wind farm consents process and those whose operations could be affected by resulting developments. MCA's participation in this research was funded by the Department for Transport's Shipping Policy Division.

MCA trials

MCA's programme was intended to assess the effect of the wind farm structures on marine systems in operational scenarios. The trials assessed all practical communications systems used at sea and with links to shore stations, shipborne and shore-based radar, position fixing systems, and the Automatic Identification System (AIS). The tests also included basic navigational equipment such as magnetic compasses.

The effects on the majority of systems tested by the MCA were found not to be significant enough to affect navigational efficiency or safety, and an on-going collection of data on such systems is expected prove these conclusions. This will be achieved by further trials, where seen to be necessary and through the collation of data observed by mariners.

Some reported effects, such as those on short range radio devices, will be further investigated as will some scenarios which could not be assessed during the trials period, such as helicopter search and rescue operations within wind farms.

The only significant cause for concern found by the MCA during the trials was the effect of wind farm structures on shipborne and shorebased radar systems. It was determined that the large vertical extent of the wind turbine generators returned radar responses strong enough to produce interfering side lobe, multiple and reflected echoes. While reducing receiver amplification (gain) would enable individual turbines to be clearly identified from the side lobes - and hence limit the potential of collisions with them - its effect would also be to reduce the amplitude of other received signals such that small vessels, buoys, etc., might not be detectable within or close to the wind farm. Mariners will require guidance on these potential effects. Bearing discrimination

was also reduced by the magnitude of the response and hence the cross range size of displayed echoes. If on passage close to a wind farm boundary or within the wind farm itself, this could in some circumstances affect a vessel's ability to fully comply with the International Regulations for the Prevention of Collisions at Sea. For full compliance, mariners will need to pay particular attention to the determination of a safe speed and to assessing risk of collision when passing near or through wind farms, particularly in restricted visibility. The cited Regulations are contained in Appendix C of which the relevant sections are Rule 6(b) (ii) (iii) (iv) and (v), Rule 7 (b) and (c), Rule 19 (a) (b) (c) and (d). It was also found that the performance of a vessel's automatic radar plotting aid (ARPA) , referred to in Rule 7 (b) ,could be affected when tracking targets in or near the wind farm.

With respect to the multiple and reflected echoes produced when wind farm structures lie between the observing radar and a relatively high sided vessel, gain reduction will have similar effects to those described above. If, as in the trial undertaken, a shore or platform based radar is intended to detect and track traffic in port approaches, Vessel Traffic Services (VTS) or in the proximity of off-shore oil or gas installations, the effects could be significant.

QinetiQ trials

The QinetiQ trials were designed to test the theoretical results calculated in previous work [1]. The previous work had calculated the expected effects of the wind turbines at the North Hoyle wind farm on marine communications, GPS and radar systems. In this report the experimental tests carried out to validate the theoretical results [1] are described. This work has been funded by NPower Renewables Ltd.

Four trials, covering the areas of GPS, VHF communications and radar tracking and radar clutter were performed by QinetiQ.

The QinetiQ GPS trial involved traversing previously defined courses through and around the wind farm. Along each course, the number of satellites visible to two different GPS systems (a Garmin 152 and a Garmin GPSIII) and the position of the ship were recorded. Our results show that on average between 8 and 11 satellites were visible at any one time providing accurate positioning to within 5 metres.

The effect of wind turbines on VHF communications was investigated by QinetiQ using a hand-held VHF transceiver that was run in series with an adjustable attenuator. A link margin of 1 dB was achieved in free-space (away from any turbines). This required an attenuation of 16dB to be added to the transceiver.

To explore the shadow region behind the wind turbines, four link margins, 2dB, 3dB, 4dB and 5dB were used. These link margins correspond to a total attenuation of 15dB, 14dB, 13dB and 12dB added to the transceiver. The closest approach to turbine 21 was 500 metres and approximately 5m behind turbine 26. As expected the depth of shadow was greater when closer to a turbine. When behind turbine 21 the shadow was found to be approximately 2dB to 3dB lower than the attenuation needed to give a 1dB link margin in free space. For turbine 26 the shadow was deeper due to the closer proximity of the VHF system. It was found that behind turbine 26 the depth of shadow was approximately 10dB below the link margin in free space. The shadow depths are

shallower than predicted theoretically confirming the worst case expectations of the theoretical work.

The QinetiQ radar shadowing trials provided very little evidence that shadowing of targets would present any significant problems. In particular the shadowing observed was, like the VHF trials, less than predicted in the theoretical study. Clutter in the radar display due to the presence of wind turbines was found to be quite considerable. Both ring-around and false plots were observed (referred to by mariners as side-lobe, multiple and reflected echoes). The observed problems could be suppressed successfully by using the gain and range settings of the radar. However, this may have the unwanted side-effect of no longer being able to detect some small targets.

Conclusions

The general findings were as follows:

- i Global Positioning System (GPS)
No problems with basic GPS reception or positional accuracy were reported during the trials.
- ii Magnetic compasses
The wind farm generators and their cabling, interturbine and onshore, did not cause any compass deviation during the MCA trials. As with any ferrous metal structure, however, caution should be exercised when using magnetic compasses close to turbine towers.
- iii Loran C
Although a position could not be obtained using Loran C in the wind farm area, the available signals were received without apparent degradation.
- iv Helicopter radar and communications systems
These trials were not carried out due to helicopter call-outs to emergencies on the trial days. The emergency services are keen that they should be undertaken when convenient. MCA will co-operate with RAF Valley and other emergency services to ensure that this is done.
- v VHF and other communications
The wind farm structures had no noticeable effects on any voice communications system, vessel to vessel or vessel to shore station. These included shipborne, shorebased and hand held VHF transceivers and mobile telephones. Digital selective calling (DSC) was also satisfactorily tested. The VHF Direction Finding equipment carried in the lifeboats did not function correctly when very close to turbines (within about 50 metres) and the BHP telemetry or short range radio link to and from its deployed RIB (rigid inflatable boat) was similarly reported to suffer interruptions.
- vi The Automatic Identification System (AIS) carried aboard MV "Norbay" and monitored by HM Coastguard MRSC Liverpool was fully operational.
- vii Small Vessel radar performance.

1. The wind turbine generators (WTG) produced blind and shadow areas in which other turbines and vessels could not be detected unless the observing vessel was moving.
2. Detection of targets within the wind farm was also reduced by the cross and down-range responses from the WTGs which limited range and bearing discrimination.
3. The large displayed echoes of WTGs were due to the vertical extent of the turbine structures.
4. These returned strong responses from sectors of the main beam outside the half power (-3dB) points and the side lobes outside 10° from the main beam.
5. Although such spurious echo effects can be limited to some extent by reducing receiver amplification (gain) this will also reduce the amplification of other targets, perhaps below their display threshold levels.
6. Sea and rain clutter will present further difficulties to target detection within and close to wind farms. Weather conditions at the time of the trials were such that these effects could not be examined.

viii Shore based radar performance

1. Short range performance (less than 6 nm)
When a small shore based radar was sited such that the height of its antenna was about six metres above sea level, its performance with respect to small vessels was similar to that of the vessel-mounted systems in terms of range and bearing discrimination and target detection within the wind farm.
When moved to a height of 200 metres above sea level there was an improvement in range discrimination.
When the higher powered and narrower beam width BHP Billiton radar was used, at the same height, the visual detection of targets within, and beyond, the wind farm was again improved.
2. Larger vessel detection
A larger vessel was easily detected within and beyond the wind farm. However, while it was broadside on to the direction of the shore radar, reflections from the turbines produced strong multiple echoes. At an oblique aspect to the radar, multiple echoes did not occur, but some reflected echoes were observed.
3. Long range radar (more than 12 nm)
When the wind farm was observed at long range by the Mersey docks and Harbour Board radar the vessel was easily detected and tracked

ix Radar and ARPA carried on larger vessels

As with small vessel radars, range and bearing discrimination were affected by the response from the WTGs. Definition was less on S band radar than on X band. Numerous spurious echoes from side lobes and reflections were reported by MV "Norbay" starting at a range of about 1.5 nm. The ship's ARPA had difficulty tracking a target vessel within the wind farm due to target swap to the stronger

response. This substantiated a similar report with respect to the BHP Billiton radar's own tracking system

x Non type-tested radar, communications and navigational equipment

The effects on such systems will be similar to those tested during the trials but will vary individually with respect to transmitted power, antenna performance, radar beam width, etc. The Royal Yachting Association is assisting MCA by providing ongoing information through the experiences of its membership.

With the exception of those noted in the next paragraph, most of the effects of offshore wind farm structures on the practical operation of marine radar, communications and navigation systems are not anticipated to significantly compromise marine navigation or safety. Where questions are raised about specific systems during the on-going collection of data they will, when possible, continue to be monitored and assessed.

There are however concerns about the use of both shipborne and shorebased radar as an effective aid to both vessel and mark detection and, consequently, for ship-to-ship collision avoidance in the proximity of wind farms. Wind farm structures generally have high vertical extents and therefore will return very strong responses when observing radars are close. The magnitude of such responses will vary according to transmitted radar power and proximity to the structures but can prevent both the visual detection of targets and the effective operation of automatic radar plotting aids (ARPA). These effects can be mitigated by vessels keeping well clear of wind farms in open water or, where navigation is restricted, keeping the wind farm boundaries at suitable distances from established traffic routes, port approaches, routing schemes, etc. Other technical solutions may be employed, particularly in port approaches.

For a particular wind farm these boundary distances should be determined in consultation with the Maritime and Coastguard Agency's Southampton HQ in conjunction with other stakeholders and included in the Environmental Statement submitted with the consent application. A Department of Trade and Industry (DTI) funded navigational risk assessment project is about to be undertaken. This will produce a methodology for assessing navigational risk - and marine risk in general - in and around offshore wind farms. It is intended to be used by government agencies for the assessment and, where appropriate, acceptance of offshore wind farm applications, and for the guidance of developers in the preparation of such applications. Included in this will be recommendations on suitable distances of wind farm boundaries from traffic routes. In the meantime, a set of recommendations based on domain theory, and taking into account the above effects, has been produced as a draft working template by MCA.

With respect to shorebased or offshore platform based systems, the careful siting of radar scanners in relation to traffic routes and wind farm configurations should enable any degrading effects to be minimised. Again, the location or relocation of required radar systems and their funding should be determined in consultation with the relevant organisations, these data included in the Environmental Statement, and submitted with the consent application.

Further work needs to be done, as for example identified in the report with respect to adverse weather conditions, helicopter search and rescue operations, short range

radio systems, non type-tested systems, etc. These should be carried out as soon as is practical.

Acknowledgements

Many individuals, companies and organisations took part in these trials. In particular the QinetiQ and the Maritime and Coastguard Agency would like to record their appreciation for the contributions of the following:

Broken Hill Proprietary Billiton Ltd., its staff and the crew of the "Clwyd"

The Chamber of Shipping

Denbridge Marine Ltd

The Environment Agency and its staff in Buckley, North Wales.

Mersey Docks and Harbour Board

NPower Renewables and the crews of "Celtic Wind" and "Fast Cat"

The P & O Steamship Company Ltd., and the officers of M.V."Norbay"

The Trinity House Lighthouse Service and its staff.

The Royal National Lifeboat Institution with the shore and sea crews of the Rhyl and Hoylake lifeboats.

Paul Frost 2nd Mechanic of Rhyl Lifeboat Station for video camera work

The Royal Yachting Association

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Abbreviations and Acronyms

| | |
|---------|--|
| AIS | Automatic Identification Systems |
| ARPA | Automatic Radar Plotting Aid |
| BHP | Broken Hill Proprietary (Billiton) |
| CA | Cruising Association |
| dB | Decibels |
| DSC | Digital Selective Calling |
| DTI | Department of Trade and Industry |
| FTC | Fast Time Constant |
| GPS | Global Positioning System |
| IMO | International Maritime Organisation |
| ISPS | International Ship and Port Facility Security Code |
| KHz | Kilohertz (radio frequencies) |
| MCA | Maritime and Coastguard Agency |
| MDHB | Mersey Docks and Harbour Board |
| MRSC | Maritime Rescue Sub-Centre |
| MHz | Megahertz (radio frequencies) |
| MV | Motor Vessel |
| NFFO | National Federation of Fishermens Organisations |
| nm | Nautical mile (1852 metres) |
| OREI | Offshore Renewable Energy Installation |
| P & O | Peninsular and Orient (Shipping Company) |
| RACON | Radar Beacon |
| RAF | Royal Air Force |
| RCS | Radar Cross Section |
| RIB | Rigid Inflatable Boat |
| RNLI | Royal National Lifeboat Institution |
| RPM | Revolutions Per Minute |
| RYA | Royal Yachting Association |
| SAR | Search and Rescue |
| SOLAS | Safety of Life at Sea |
| THLS | Trinity House Lighthouse Service |
| UHF | Ultra High Frequency |
| UK | United Kingdom |
| US | United States |
| μ s | Microseconds |
| VHF | Very High Frequency |
| VTs | Vessel Traffic Services |
| WTG | Wind Turbine Generator |

1 Introduction

1.1 Background

Offshore wind farm installations are new to the United Kingdom and comparatively so to other countries' waters. The installations are large in area, and in the number and size of their structures. However, at the few sites where wind farms have been constructed, little detailed practical research on their effects on navigation and communications systems has been undertaken. Some relevant known research is listed in the reference section at the end of this report [5][6][7].

Experience with other types of offshore structure and the results of desktop studies indicated that offshore wind farm structures might have the potential to interfere with shipborne, shorebased and airborne radar, VHF communications and also - although with a lower probability - position fixing, guidance and Automatic Identification Systems (AIS).

Offshore wind farms, consented under Round 1 and proposed under Round 2, cover large areas of open water and hence present potential hazards to navigation. A number of them are considered to be close to or encroach into waters where there is a high density of shipping movements or be close to waters used by fishing vessels and recreational craft. Their positions are necessarily those which are exposed to weather conditions which could affect the navigation of vessels, particularly small craft. Their locations are, for technical reasons, in relatively shallow waters near shoals, and therefore in close proximity to restricted waters used by small craft and also shipping inshore gaining access to ports or to those waters providing a more sheltered passage required in inclement weather and sea conditions. Tidal streams of varying sets and rates pass through all wind farm sites. Some sites are within port limits and some lie within Vessel Traffic Services (VTS) operational limits.

Of necessity, when a vessel is within or close to a wind farm, mariners should be able to place similar reliance on marine navigation systems as in open sea areas, or they should be fully appraised of any induced errors or limitations which might be encountered. From the aspect of collision avoidance, vessels need to be able to detect other craft with which they might be in an encounter and to take appropriate avoiding action.

Port authorities and VTS operators require effective detection, identification and tracking of vessels navigating in their areas so as to be able to organise traffic or provide traffic information and navigational assistance services to vessels operating within port approaches or prescribed routing schemes to meet their statutory responsibilities in respect of the safety of navigation. The importance of effective detection and identification is further emphasised by the implementation of the International Ship and Port Facility Security (ISPS) Code from 1 July 2004.

Emergency services such as Royal National Lifeboat Institution (RNLI) vessels, HM Coastguard and RAF helicopters require the ability to rapidly detect and react to maritime casualties.

All of the foregoing require consistent and effective radio communications systems.

Failure of any radar, navigation or communication system could give rise to increased

risks to safety or lead to marine casualties and insurance claims or reduce the effectiveness of emergency service operations. Incidents involving passenger vessels and those carrying dangerous and polluting cargoes could have serious consequences for the public and the environment, both at sea and ashore.

1.2 Objectives

The proposed research was intended to obtain scientific and practical operational data on various navigation and communications systems' performance within and in the vicinity of offshore wind farms. In particular, any degradation of the performance of systems was to be determined, quantified and, where considered necessary, cost effective solutions recommended. The offshore wind farm used in the investigation was the 30 turbine wind farm at North Hoyle, off the North Wales coast at Prestatyn. A map containing the wind farm is presented in Figure 1-1.

These data will be used to inform mariners, the shipping and ports industries, the General Lighthouse Authorities, the National Federation of Fishermen's Organisations, the emergency services, the Royal Yachting Association, wind farm developers and all other interested parties, of the extent of any system limitations, any consequent increased risks and, where necessary, recommendations as to how these should be mitigated.

This outcome may also be used to inform the consents process of offshore wind farm applications.

In addition to these aims, experiments were carried out to test the theoretical results from an earlier study [1]. This earlier study predicted the impact on marine radio systems by the North Hoyle wind farm.

In the theoretical study [1] it was found that wind turbines have very large radar cross-sections (RCS), which means that they will scatter a large proportion of any incident electromagnetic energy. In addition to this shadows will be cast behind the turbines looking from the direction of the transmitter.

The theoretical study suggested that small vessels within the North Hoyle wind farm would be detectable with marine radar (3GHz and 9GHz) if they were not in the shadow from a turbine. However, detection of the vessel could be compromised if it is very close and directly behind a turbine. The effect of the shadow at 3GHz was found to be much less severe than at 9GHz.

The impact on GPS was found to be minimal and any interference would very rarely cause any corruption to the GPS data. It was determined that unless a GPS receiver is within 70m (based on a signal-to-noise ratio of 15dB) of a wind turbine then any interference would be insignificant.

The theoretical study [1] also considered VHF communications. It concluded that due to the wavelength of the VHF systems any interference caused by wind turbines would be negligible.

Four different trials were designed to test the validity of the results from the theoretical study outlined above. The full technical details of these trials are presented in the trial plan[2].

1.3 Content

This report is separated into several sections that deal with the GPS, VHF communications and radar trials undertaken by QinetiQ and the MCA. In each section the experimental process is described and the results are presented in full. The structure to the report is as follows:

- Section 2: QinetiQ GPS trials
- Section 3: QinetiQ VHF communications
- Section 4: MCA VHF communications
- Section 5: QinetiQ Radar trials
- Section 6: MCA Radar trials
- Section 7: MCA marine navigation system trials

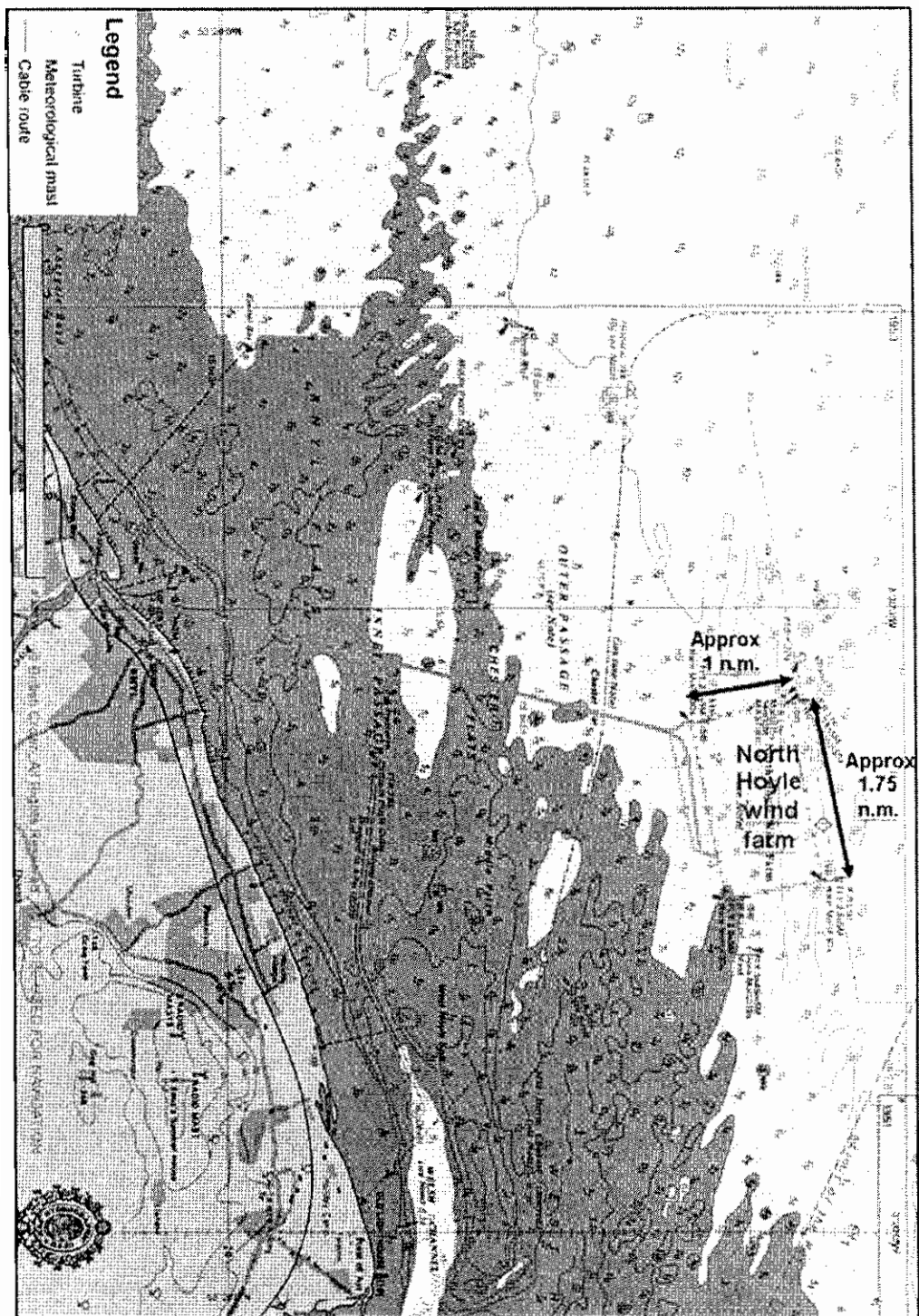


Figure 1-1: The wind farm at North Hoyle

2 QinetiQ GPS trials

2.1 Overview

The number of satellites visible to a GPS system bears a direct relation to the accuracy of the positioning. For the GPS system to work there must be line-of-sight to at least four satellites. At any one time the GPS units can usually receive signals from up to twelve satellites. The more satellites that can be used in a positioning measurement, the more accurate the estimated position will be. The original theoretical study [1] demonstrated that it is unlikely that any electromagnetic interference will effect the normal operation of GPS system, unless the receiver is in very close proximity to a turbine tower.

The GPS trials consisted of piloting a launch along three predefined courses. Two control runs, away from the wind farm were also made. On each course the number of satellites used by the GPS receiver was recorded along with position. Two GPS systems were used, a Garmin GPSIII and a Garmin GPS152. The first is a typical hand-held GPS receiver and the second is typical of what might be found installed on small ships, launches and pleasure craft.

Full details of the experimental methods for the GPS trials can be found in the trial plan [2].

The antenna for the GPS152 was positioned on the cabin roof as illustrated in Figure 2-1. The hand-held GPSIII unit was positioned at the centre of the rear deck of the vessel.

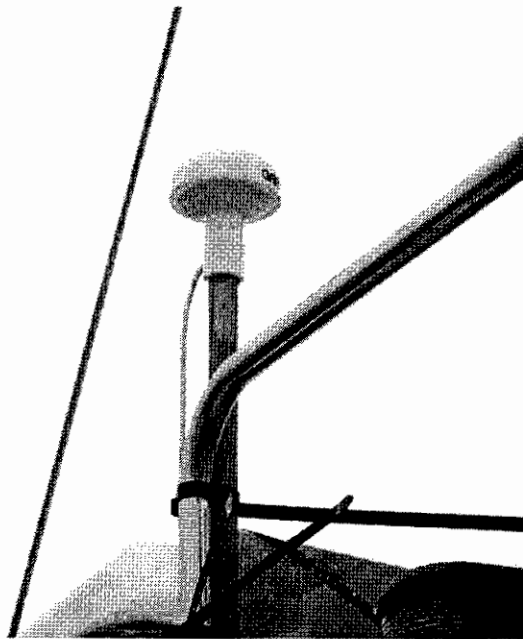


Figure 2-1: The position of the antenna for the Garmin GPS152 unit

2.2 Results

2.2.1 Control runs

Two control runs were made in order to determine the number of satellites visible when there were no possible obstructions to the line-of-site. The number of satellites locked with time is shown in Figure 2-2 for both the control runs.

Here we can see immediately that the visible number of satellites on each control run and for each GPS system is relatively stable in time. Furthermore, the total number of satellites visible is 9 for the GPSIII and 10 for the GPS152. This provides us with an expected number of satellites to work with when considering the different courses in and around the wind turbines. In addition to the expected number of satellites, we are also able to estimate the likely uncertainty in position estimation by the GPS units and compare these to the uncertainties provided when in the wind farm. In the control run, the recorded uncertainty in position was between 4m and 5m.

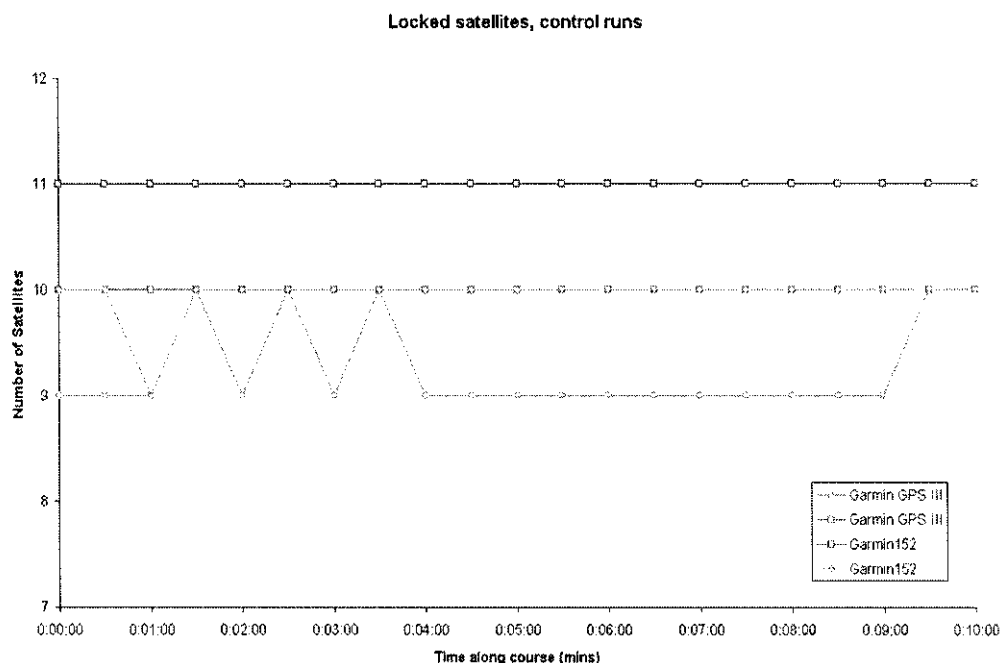


Figure 2-2: Locked satellites on the two control runs

In 2-3 and Figure 2-4 examples of the displays for the GPSIII and GPS152 units are shown. It can be seen in the figures that the number of satellites locked onto by the two GPS systems is eleven in each case. Furthermore, a twelfth satellite that is visible to the GPS152 unit.

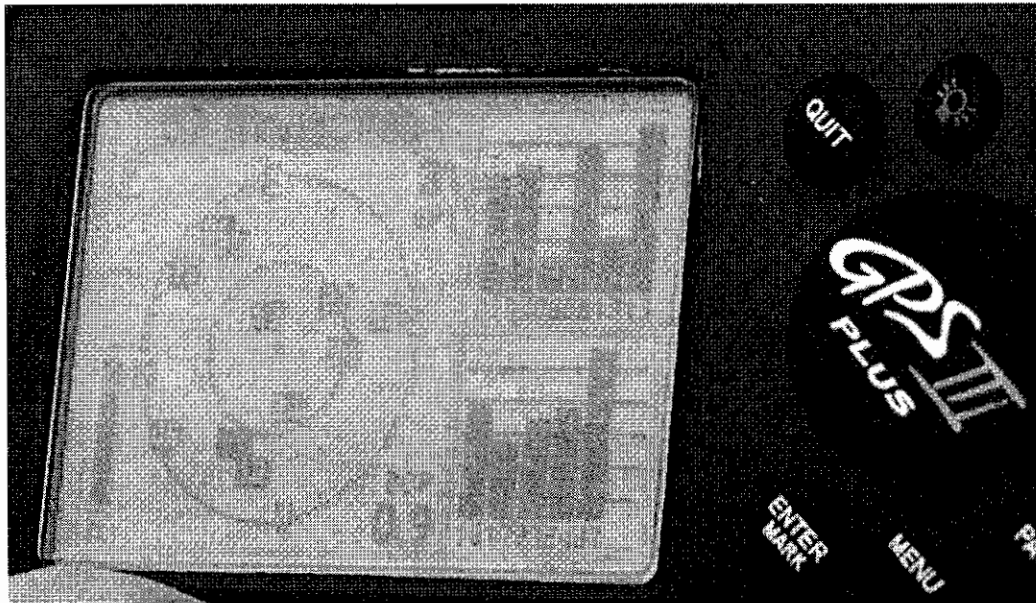


Figure 2-3: The display from the Garmin GPSIII unit during a control run

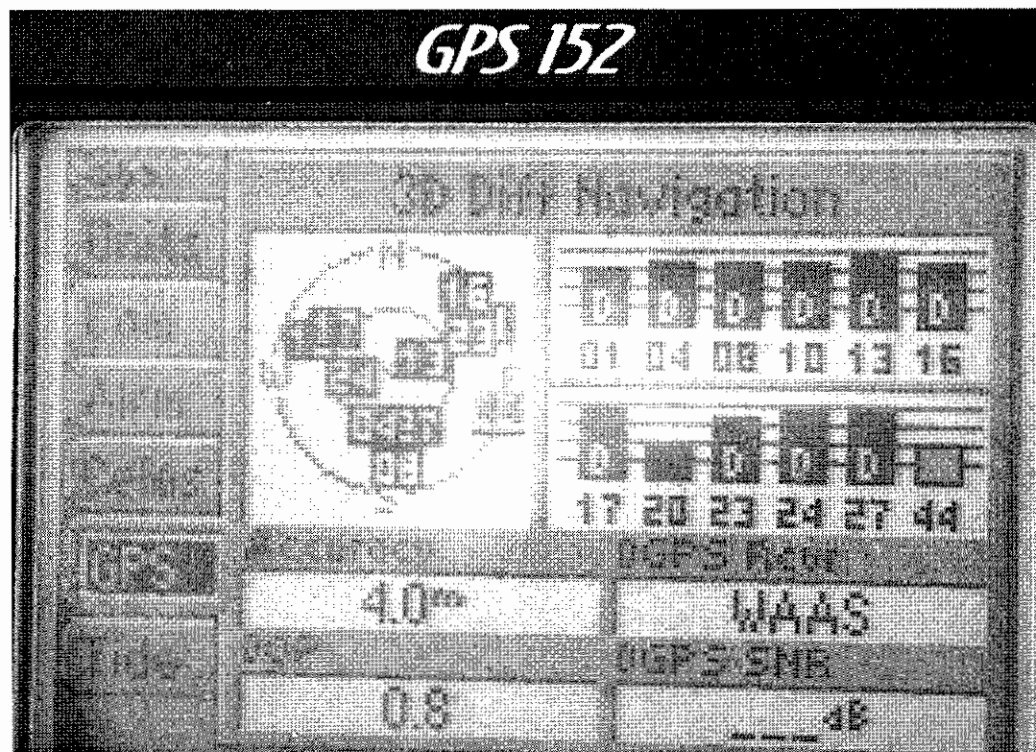


Figure 2-4: The display from the Garmin GPS152 unit during a control run

2.2.2 Trial courses

The track data recorded by both GPS units along the three predefined courses is plotted in Figure 2-5. The positions of the turbines are also indicated in the figure.

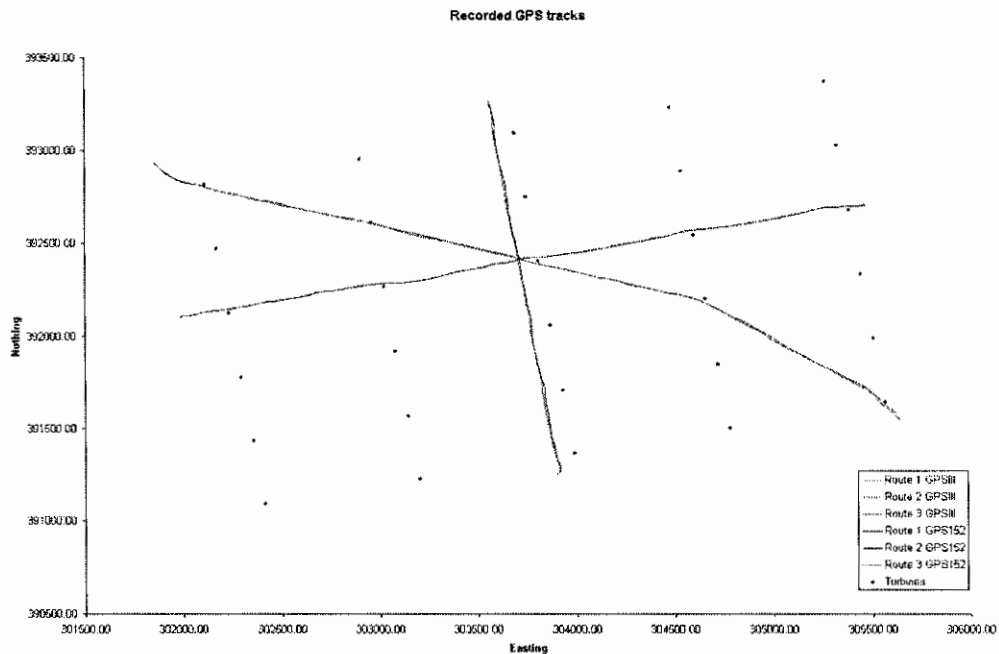


Figure 2-5: The recorded GPS track data for the three routes used in the trial

2.2.3 Course one

The first course is a path from the northern side of turbine 16 to turbine 20 (as described in [2]). The course runs in a direction parallel to the longest side of the wind farm as is shown by the green and brown lines in Figure 2-5.

In 2-6 we present the number of satellites locked onto by the GPS units with respect to time. It can be noted from the plot that for both the GPSIII and GPS152 the number of locked satellites is slightly less consistent than was seen in the control runs. However, for both GPS units between 8 and 10 satellites remains locked at all times providing an uncertainty in the estimated position of between 4m and 6m. It is important to note that for successful operation of a GPS unit, only four satellites are required. A greater number of satellites provide a greater accuracy in position.

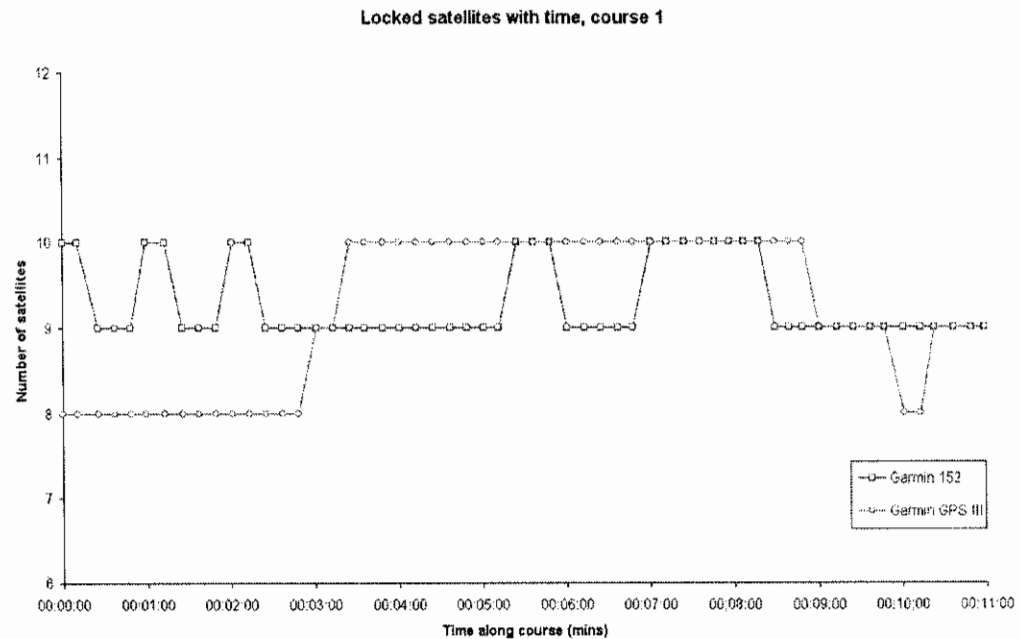


Figure 2-6: The number of satellites locked onto by the GPS units along course 1

2.2.4 Course two

The second course used to test the GPS systems ran parallel to the shortest side of the wind farm from the western side of turbine 3 to turbine 28 (see the blue and purple lines in Figure 2-5).

We found that on the course the number of satellites locked onto were 8 for the GPSIII and 10 for the GPS152. The uncertainty in position was recorded as 5m. It is interesting to note that the GPS152 appears to have a consistently higher number of satellites than the hand held GPSIII. However, this is likely to be a result of the elevated position of the GPS152 antenna (on the roof of the launch cabin). The hand held antenna was much lower on the boat and thus more susceptible to shadowing from objects other than the wind turbines. The results for the second course are presented in Figure 2-7.

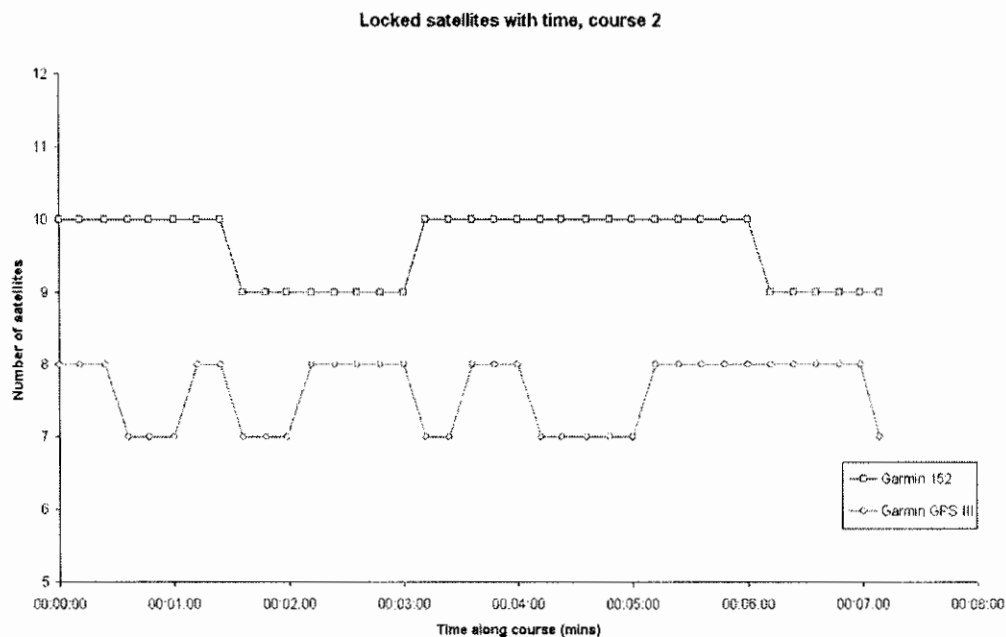


Figure 2-7: The number of satellites locked onto by the GPS units along course 2

2.2.5 Course three

The vessel was piloted diagonally through the wind farm from the south of turbine 5 to the south of turbine 26 and the data log of the course is shown in Figure 2-5 (red and light blue lines).

Here we find that there is very little variation in the number of locked satellites for either GPS system. The data is shown in Figure 2-8 and it can be noted that the GPSIII has 8 or 9 satellites locked at all times. The uncertainty in the positioning is around 4m. The GPS152 has 8 to 11 satellites locked and because of the variation in satellite number, the uncertainty in position was found to be much more variable, being between 3m and 5m. However, despite this overall operation of the GPS units was not affected adversely at any time.

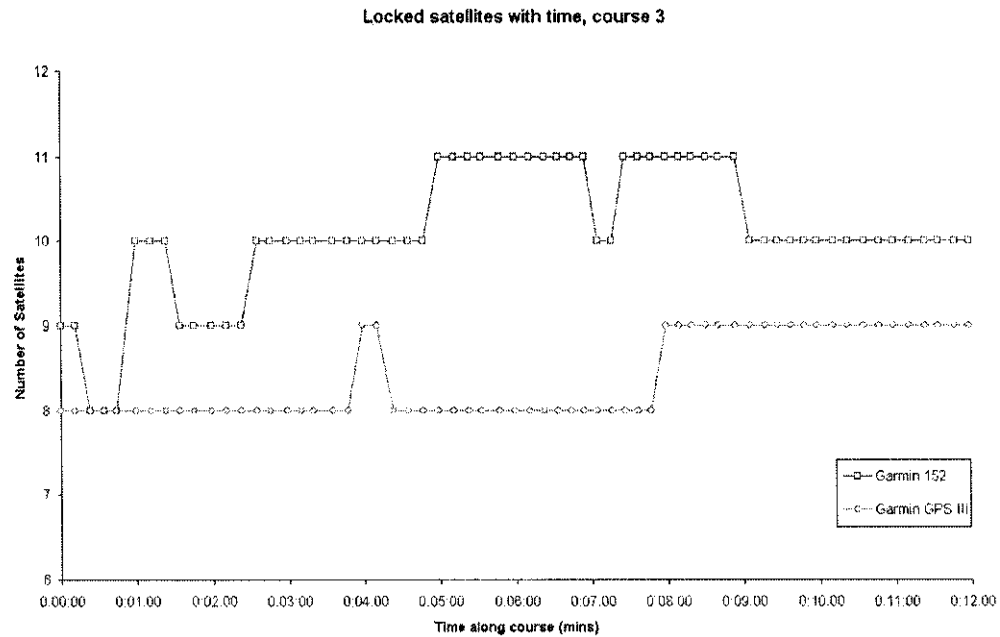


Figure 2-8: The number of satellites locked onto by the GPS units along course 3

2.2.6 Additional tests

In addition to the courses described above the GPS units were tested whilst the launch was stationary and adjacent to a turbine. Four turbines (numbers 7, 9, 13 and 17) within the wind farm were used in an attempt to shadow different parts of the sky.

We found that regardless of our proximity to a turbine the GPS units operated normally without any undue loss in the number of visible satellites. The results are summarised in Table 2-1. It should also be noted that in each case the estimated error in position with both the GPSIII and GPS152 was between 3 and 5m.

| Turbine | Number of satellites locked | |
|---------|-----------------------------|--------|
| | GPS152 | GPSIII |
| 7 | 11 | 11 |
| 9 | 10 | 11 |
| 13 | 10 | 10 |
| 17 | 11 | 11 |

Table 2-1: Summary of visible satellites when adjacent to a turbine

2.3 Summary

The various experiments performed during the GPS trial showed that the wind turbines did not give rise to any loss in the number of locked satellites. The significant outcome of this is that the normal operation of the GPS system was never at risk of failure, due to interference from wind turbines.

The additional tests showed that even with a very close proximity of a turbine tower the GPS antenna, there were always enough satellites elsewhere in the sky to cover for any that might be shadowed by the turbine tower.

3 QinetiQ VHF communications

3.1 Overview

The use of VHF communications within the maritime community is wide spread. It is used for both ship-to-shore and ship-ship communication. It is essential that such communications are free from interference induced by intermediary structures since they are used in emergencies. The theoretical results have shown that the shadow at VHF frequencies behind a wind turbine tower is relatively shallow and should not adversely affect the normal operations of any VHF communication system. The VHF trial was designed to assess the depth of shadow behind wind turbine and compare the trial results with those expected theoretically.

The trial consisted of traversing a course that passed within 5m behind turbine 26 . A continuous communication to the receiver set up on the shore at Prestatyn was used. The track data along the course was recorded to provide an indication of when the vessel was in the turbine shadows, thus affecting the signal. The antenna and receiver set up at Prestatyn is shown in Figure 3-1. Link margins of 2dB, 3dB, 4dB and 5dB were employed to estimate the depth of shadow experienced. The link margin is the strength of the signal received above the noise level. In free space at a fixed range the link margin was found to be 17dB (i.e. the signal is 50 times stronger than the noise level). We added an attenuation of 16dB to reduce the link margin to 1dB above the noise level and this was used as the baseline for all the VHF tests.

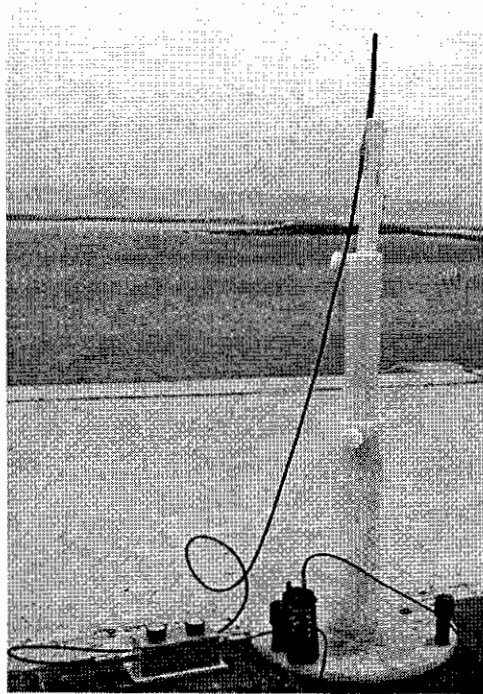


Figure 3-1: The VHF antenna and receiver set up at Prestatyn

3.2 Results

In free space, away from the wind turbines, to get the link margin of 1dB required an attenuation of 16dB to be added in series with the receiver antenna.

The results from all the different link margins are plotted together in Figure 3-2 and in Figure 3-3. The first of these figures shows the courses taken by the vessel when a 2dB and 3dB link margin was being used. In each case the uncertainty in our measurement is 1dB. On the graphs, the loss of signal is represented by the sudden drop in northing on the track. This "drop" shows the point at which the VHF signal was lost. The projection of the turbine shadows are shown as thick black lines.

In Figure 3-2 it can be seen that the shadows from turbines 26 and 21 have contributed to a loss in the VHF signal. It can also be noted in the figure that with a 2dB link margin there is a loss in the signal that occurs between the easting values of 301913m and 301942m. Similarly another loss, not attributable to any turbines exists around the easting value of 302075m. These are the result of interference from other sources, such as another broadcasts on the same VHF channel.

Turbine 21 is approximately 500m from the path of the launch. At this distance behind a wind turbine the shadow predicted is approximately 2dB (at 150MHz). Considering that the uncertainty in the link margins is of the order of 1dB, our experimental results are in very good agreement with the predictive work undertaken previously [1].

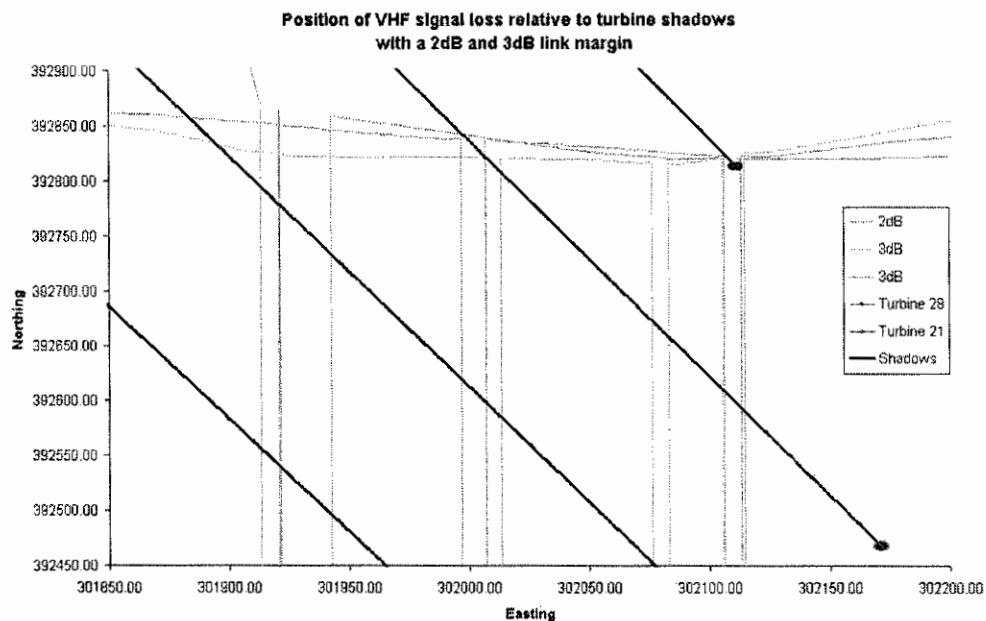


Figure 3-2: Position of VHF signal loss relative to turbine positions with a 2dB and 3dB link margin

Figure 3-3 shows the position at which a signal loss was observed when the link margins were 4dB and 5dB. Here the signal loss only occurs in the shadow of turbine 26. This is expected since the 2dB and 3dB link margin results (Figure 3-2) showed the shadow of turbine 21 at 500m to be only 2dB to 3dB.

A further experiment to find the depth of shadow immediately behind a wind turbine was undertaken. This test involved adjusting the link margin when immediately behind a turbine in the shadow until the signal was regained. We found that the depth of shadow at this position behind a turbine was around 10dB.

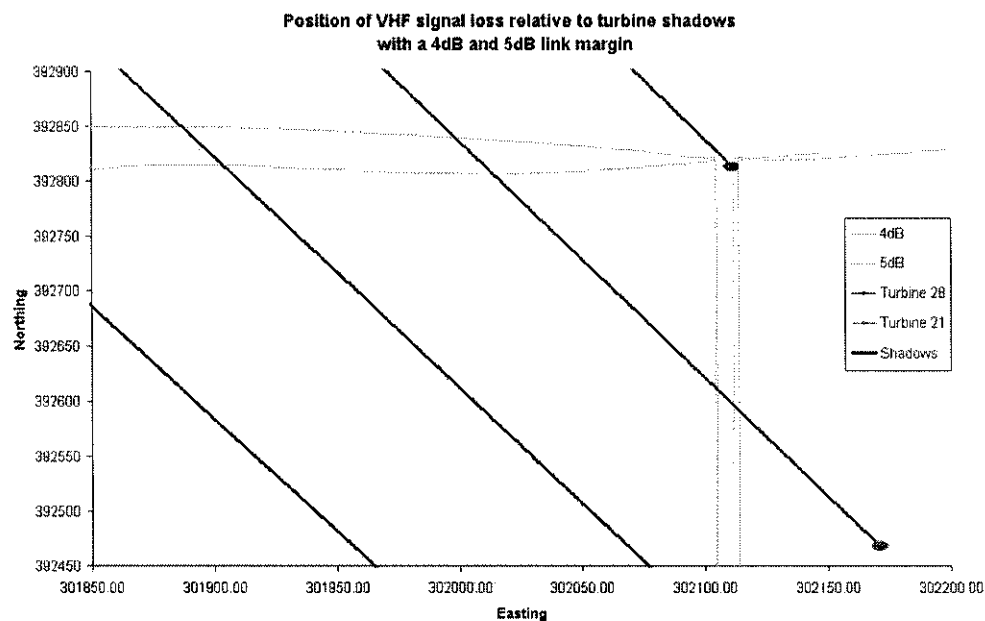


Figure 3-3: Position of VHF signal loss relative to turbine positions with a 4dB and 5dB link margin

3.3 Summary

The shadows found experimentally agree with the theoretical results outlined in the original study [1]. The affects are small and will not effect the VHF systems used in the wind farm unless the link margin between the transmitter and receiver is very low. This will only occur at long range and other effects caused by other users on the VHF channel are likely to present a greater problem.

4 MCA VHF communications trial

4.1 Overview

To evaluate the operational use of typical small vessel VHF transceivers when operated close to wind farm structures.

4.1.1 Equipment used

The following was required for the trial:

- A person with a hand-held VHF radio landed on a turbine platform and a vessel fitted with a typical small craft VHF radio;
- Co-operation of RNLI lifeboats, with RNLI shore stations, HM Coastguard and Mersey Docks and Harbour Board.

4.1.2 Method

In calm weather conditions, a person was landed on the platform of turbine 28 from the Hoylake lifeboat "Lady of Hilbre" which then moved away from the turbine. The Rhyl lifeboat "Lill Cunningham" was stationed as close to the south of turbine 3 as was safe and practical. The person on the platform positioned himself on the northerly side of the turbine tower, i.e. at the point at which the full diameter of the tower lay between him and the direction of the lifeboat.

Using VHF channel 10 and others designated for this purpose by HM Coastguard, the person on the platform transmitted in a normal conversation voice. The quality of the reception was noted by the lifeboat crew and the designated shore stations.

The lifeboat's VHF radio direction finding equipment then used this signal to determine its bearing and a comparison made with the true known bearing, any difference being recorded.

The Rhyl lifeboat then proceeded in an easterly direction on a course passing as close as was safe and practical to the other turbines on the southern boundary of the wind farm. The quality of the reception being recorded. When past turbine 1, the course was reversed, and the effects similarly noted until turbine 5 was reached. This schematic is illustrated in Figure 4-1.

The vessel's GPS positions were recorded during the whole exercise so that if any degradation of communication or direction finding is found to exist, the arcs over which this occurred could be calculated.

A principle of these tests was that, if small vessel ship-to-ship and ship-to-shore communications were not affected significantly by the presence of wind turbines, then it is reasonable to assume that larger vessels, with higher powered and more efficient systems would also be unaffected.

During this time a number of mobile telephone calls were made from ashore, within the wind farm, and on its seawards side. No effects were recorded using any system provider.

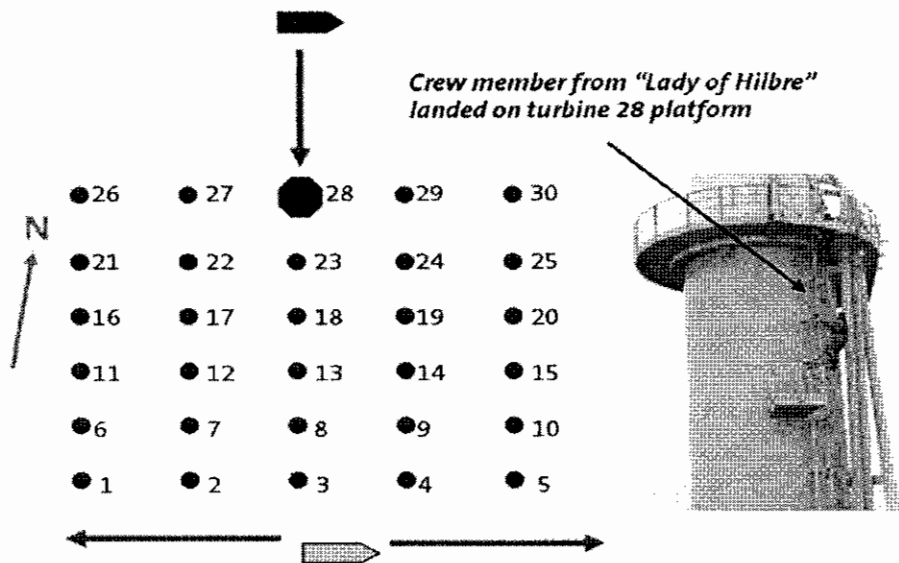


Figure 4-1: MCA VHF communications evaluation schematic

4.2 Results

4.2.1 VHF Communications

The wind farm structures had no noticeable effect on voice communications within the wind farm or ashore.

However, the use of the lifeboat's automatic digital direction finding equipment was severely impaired when very close to a turbine tower on the far side of which lay the transmitting vessel's direction. This was resolved when the lifeboat moved further than 50 metres from the tower.

If this effect is recognised, it should not be a problem in practical search and rescue (SAR).

4.2.2 Other communication methods

- **Mobile telephone communications** : There was no noticeable effect on mobile telephone communications systems.
- **Digital Selective Calling (DSC)** : The DSC system communications within the wind farm, contact being made via Holyhead and Liverpool Maritime Rescue Sub-Centres.
- **Automatic Identification System (AIS)** : AIS operated satisfactorily between vessels and as monitored by HM Coastguard MRSC Liverpool, indicated that both VHF and GPS components operated satisfactorily.

Since it had already been determined that GPS and VHF were not significantly affected by the wind farm structures, the "Norby" was simply asked to use her AIS when around and in the wind farm, and Liverpool MRSC to log the

reception from the ship. "Norbay" reported that she picked up other vessels' AIS transmissions without problems and Liverpool that they had similarly picked up the ship itself.

It could be argued that there might have been a ship in the area which did not receive "Norbay"s signals, or was not picked up herself by "Norbay". In view of the other evidence, however, this seems very unlikely. As noted in the Executive Summary with respect to on-going data collection, AIS-fitted vessels and HM Coastguard will report any possible omissions.

- **Telemetry Links** : The UHF telemetry link between the service vessel "Clwyd", its RIB and the BHP Billiton shore station at Gwaenysgor was reportedly interrupted when the RIB was close to turbine towers. Telemetry is normally used on fixed installations for communicating measurements such as wave and tidal heights, wind speeds, etc. However, the Radio Agency has specific requirements for short range devices that do not require licensing and may be used on marine mobiles. Any reported effects should be investigated further.

5 QinetiQ radar trials

5.1 Overview

There were two parts to the radar trials. The first dealt with the clutter effects on ship-borne radar and the second considered shadowing from wind turbines.

The radar shadow trial involved a launch travelling along a predefined course whilst being monitored by an on-shore radar at Prestatyn. The radar clutter (spurious echoes) trial used the launch "Fast Cat" to see what effect the wind turbines have on the radar display at different ranges and gain settings. Full technical details of these tests can be found in the trials plan [2].

5.2 Radar clutter trial results

Four different positions from the centre of the wind farm were used for the spurious radar echo trial. The first position is at the centre of the wind farm. The second and third positions are 1000m and 3000m from the centre of the wind farm respectively. The fourth position is approximately 6000m from the wind farm centre. The radar screens at each of these ranges, when using different gain settings, are shown in Figure 5-1 to Figure 5-6. In all the figures the position of the launch is in the centre of the radar display, at the bottom of the vertical line.

At the centre of the wind farm, the radar display when the gain is automatically set and manually adjusted is shown in Figure 5-1. It can be noted that the automatic gain setting is inappropriate in this case. The figure shows significant numbers of false plots (spurious echoes) of turbines and the beginning of ring-around (side lobe echoes). Using manual adjustment to reduce the gain from 60% to just 20%, the spurious echoes are almost removed entirely.

In Figure 5-2 the radar display at the second position, 1000m from the wind farm centre is presented. Here it can be observed that at a range setting of 1/2 nm there is effectively no clutter visible. However, with a 3nm range setting there is significant clutter on the radar display. In both cases the radar gain was on the automatic setting. The radar displays at position 2 illustrate how altering settings on the radar system can improve the visible output. In this case moving to a shorter range has lowered the gain. A different pulse length is also used on this range scale.

The radar displays observed at position 3 are presented in Figure 5-3. These figures show that the wind turbines are much clearer at the lower gain setting. Furthermore, in both cases there are very few false plots or evidence of side lobe break through originating from the turbines.

In Figure 5-4, Figure 5-5 and Figure 5-6 the radar screens observed with gain settings of 64% (automatic setting), 54%, 44%, 34% and 24% are shown. It can be noted that the turbines are visible as discrete plots. The large region of clutter is the coastline. As the gain is reduced, the wind turbines remain on the screen although by a gain of 34% a number of the turbines have disappeared. With a gain setting of 24% the number of visible turbines has reduced significantly. It is interesting to note that the turbines that do disappear are turbines that are shadowed by other turbines. A further consequence of reducing the gain is that small targets at long range may no longer be detectable.

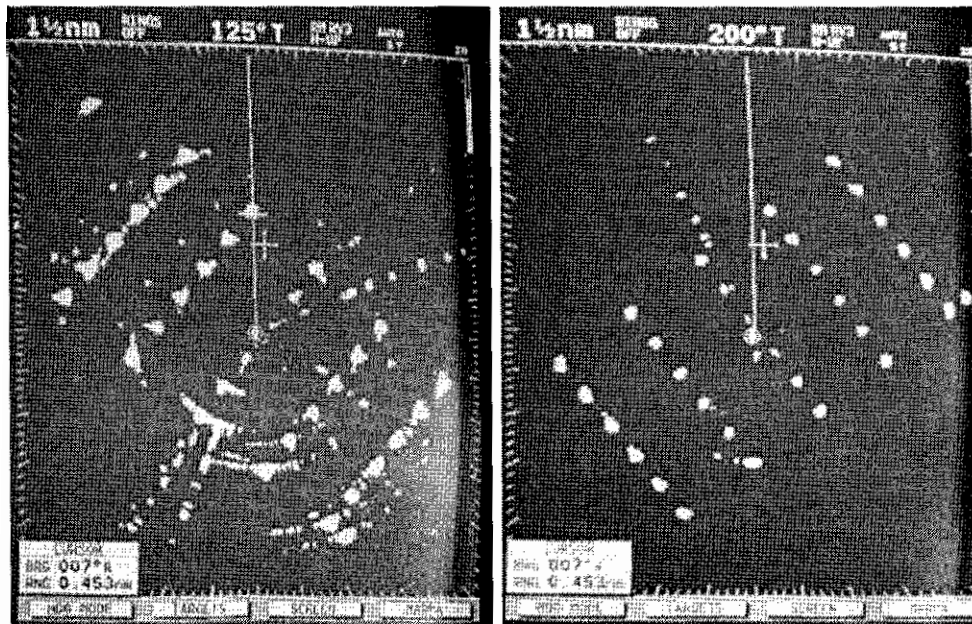


Figure 5-1: Position 1, the wind farm centre, with gain settings of 60% (left) and 20% (right)

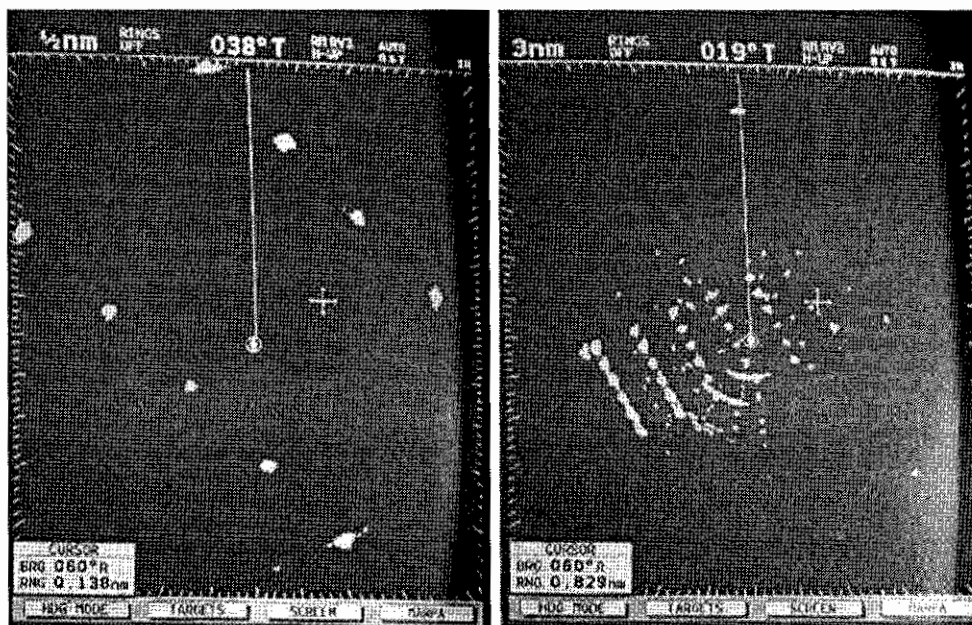


Figure 5-2: Position 2, 1000m from wind farm centre, close up (left) and the whole wind farm (right) with an automatic gain setting

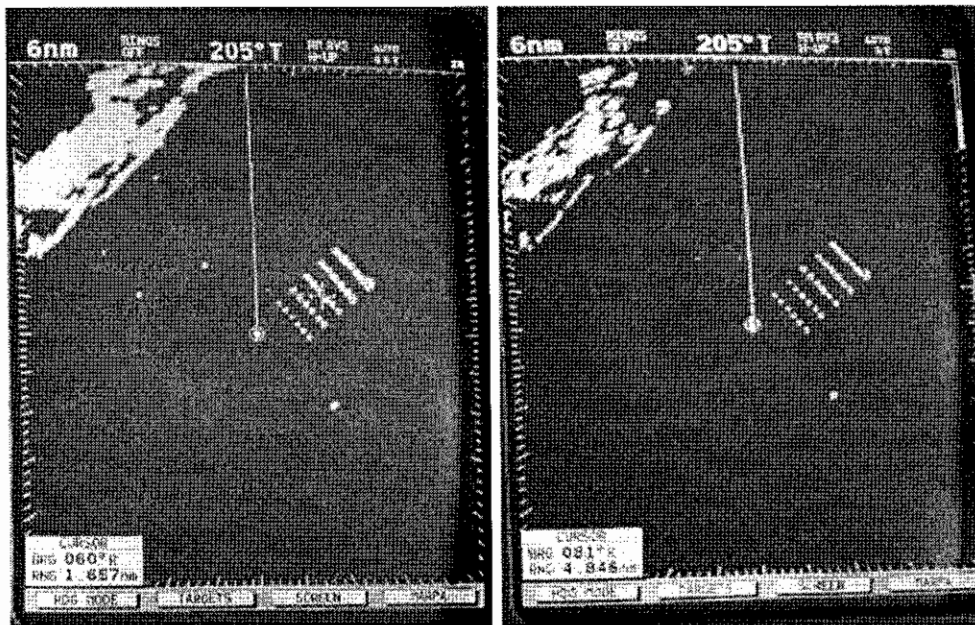


Figure 5-3: Position 3, 3000m from wind farm centre, 74% gain (left) 44% gain setting (right)

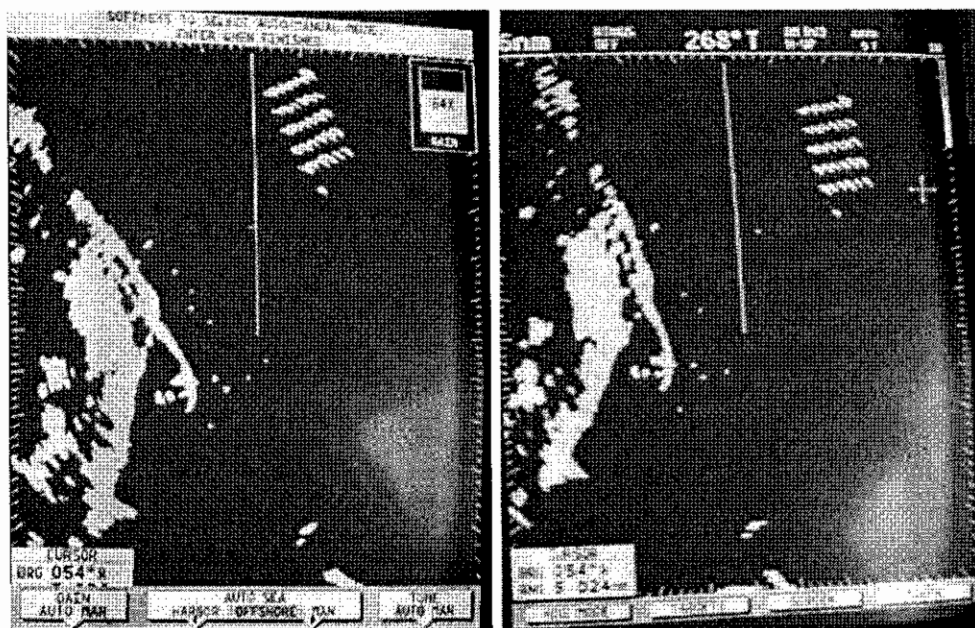


Figure 5-4: On route to the wind farm with 64%(left) and 54%(right) gain settings

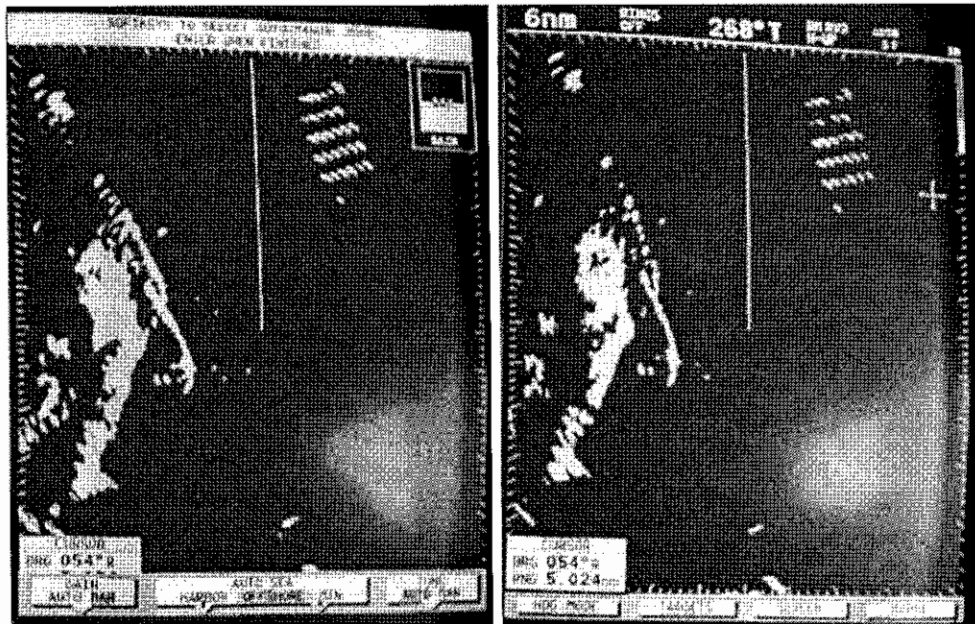


Figure 5-5: On route to the wind farm with 44%(left) and 34% gain settings

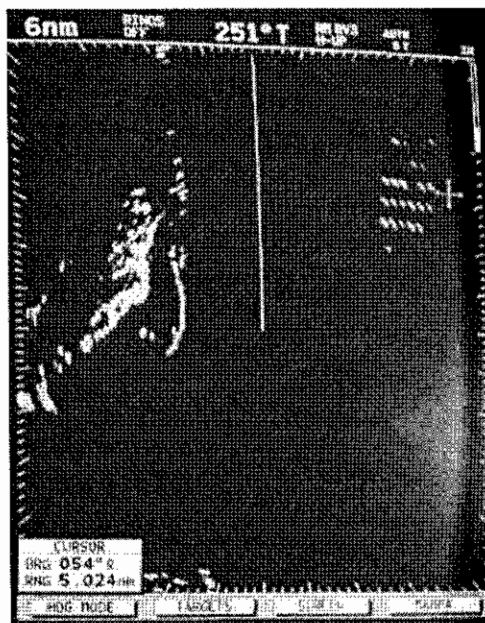


Figure 5-6: On route to the wind farm with 24% gain setting

5.3 Radar shadow trial results

As outlined above and in more detail in the trial plan, the radar shadow trials involved monitoring the radar display of a shore based radar at Prestatyn. Specifically, the purpose of the trial was to look for signal loss of the target boat, due to the presence of wind turbines. Shadows at the radar frequency of 9.4GHz are deeper than those seen at VHF frequencies (150MHz).

If we consider the gain settings of the radar then an estimate of the shadow depth can be gauged.

The peak power of the radar is 4kW which corresponds to 36 dB. Assuming a log adjustment to the gain we find that, for example, at 54% gain the power is 19.44 dB. With a gain setting of 54% or 19.44 dB the wind turbines were visible. However, reducing the gain to 44% or 15.84 dB we found that the unshadowed turbines were still visible, but the shadowed turbines had disappeared from the display. The distance behind the shadowing turbine was approximately 1000m. A further reduction of the radar gain to 4% or 1.44 dB, it was found that the unshadowed turbines began to disappear. This can be seen in Figure 5-4 to Figure 5-6

From these observations we find that the difference in power required to detect an shadowed (1000m behind a shadowing turbine) and unshadowed turbine is approximately 14.4 dB.

At 1000m the theoretical study[1] suggests that the shadow depth behind a wind turbine is approximately 14.5 dB, which agrees very well with the estimate made using the radar displays and radar gain settings.

5.4 Summary

There were two parts to the radar trials. The first dealt with the clutter effects on ship-borne radar and the second considered shadowing from wind turbines.

In the first trial it was found that adjusting the radar gain could reduce the number spurious echoes significantly. However, a consequence of gain reduction is that small targets at long range may no longer be detectable. And at very low gain settings (approximately 34% or less) some shadowed wind turbines start to disappear.

The second part to the trial dealt with radar shadows behind wind turbines. It was found that the depth of shadow at a distance of 1000m behind a turbine was approximately 14.4dB. This value was consistent with those determined in theoretical studies undertaken previously [1].

6 MCA Radar trials

6.1 Overview

The wind turbine generators (WTG) are very large structures in the vertical plane and significantly so in the horizontal plane. Although the towers are cylindrical, their diameter of 5 metres and height above the water - around 70 metres - is such that they have a comparatively large reflecting surface area. This is compounded by the reflecting surfaces of the platforms, ladders and other structural features of the towers, an average total of about 80 square metres of signal returning surface at any time and from any direction. The three bladed rotors have a total reflecting area of around 200 square metres when their plane is at right angles to the direction of the radar scanner, and around half that when in line with it. The nacelle and boss have reflecting areas of up to 16 square metres. Thus in the vertical plane the North Hoyle WTGs can have a radar signal returning area of around 300 square metres. The sections of turbine which are other than at right angles to the shipborne radar, i.e. non-returning, may produce reflected and other spurious echoes. The scale of the structures is better illustrated in Figure 6-1.

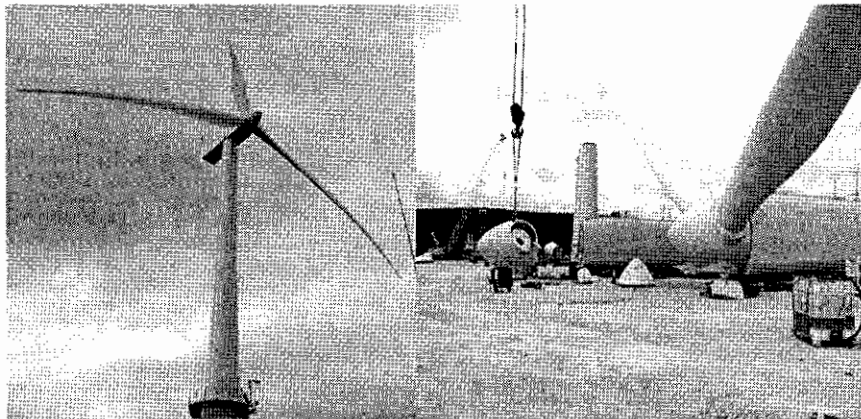


Figure 6-1: North Hoyle Vestas wind turbines

This is a critically important factor when shipborne or VTS radars are close to the WTGs. Here the vertical beam width, for most ships' radars this being between 25 and 30 degrees, has a greater effect than the horizontal beam width, usually between 1 and 2 degrees.

When close to turbines, the response from individual transmitted pulses may therefore be significantly greater than if, for example, at the same range from a large ship which would be unlikely to have an equivalent vertical extent.

This has some advantages in, for example, detecting wind farm structures by radar, but can have disadvantages with respect to the use of radar in SAR, automatic radar plotting aids (ARPA), collision avoidance or vessel traffic services (VTS). It will also have implications for the siting of radar beacons (RACONS).

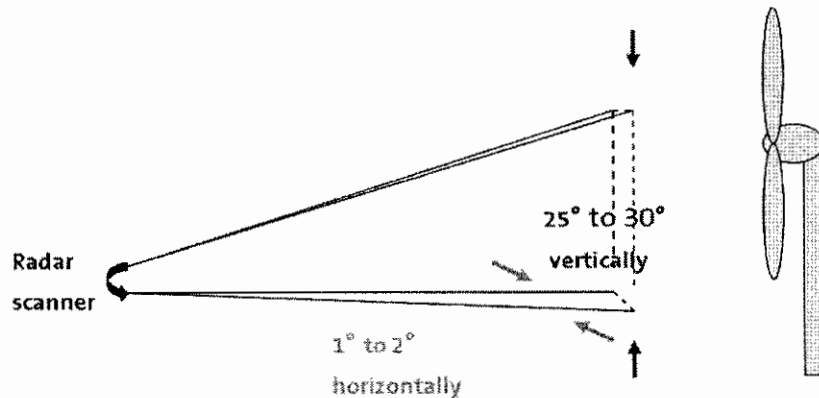


Figure 6-2: Typical radar scanner horizontal and vertical beamwidths

As the radar station increases in distance from the wind farm, this effect reduces in significance. For example, as will be seen in subsection 6.16.1, at the range of the Mersey Docks and Harbour Board's Seaforth radar from the wind farm, 14 nautical miles (nm), the vertical extent of the WTGs has little effect and larger vessels such as the "Norbay" (17,464 Gross Tons) could be detected and tracked. Smaller vessels, such as the lifeboats and service craft could not be detected at this range.

Technical details of all the radar systems used by the MCA during the trials can be found in Appendix B.

This report is not intended to explain marine radar systems or their operation. A number of publications are available that deal with this and other marine navigation subjects. An example is suggested in reference [4].

6.2 Small vessel radar evaluation

6.2.1 Overview and method

To evaluate the operational use of typical small vessel radar systems when used to detect vessels within and close to wind farms.

With the Rhyl lifeboat "Lill Cunningham" lifeboat stationary very close to the northern side of turbine 3, the Hoylake lifeboat "Lady of Hilbre" traversed the wind farm on a track midway between the turbine rows 10 to 6 and 15 to 11, on a straight line course parallel to these towers. The vessel then proceeded to the south of turbine 21 and similarly passed between the rows 16 to 20 and 21 to 25. Finally, the vessel proceeded to a point 250m north of turbine 30 and followed a course parallel to the northern boundary of the wind farm. The stationary "Lill Cunningham" at turbine 3, fitted with the video camera, with the radar set on the 3 nautical miles range, recorded the displayed data. The data was analysed to determine the blind arcs and shadow areas produced by turbine 3 and others in the wind farm. The courses followed are illustrated in Figure 6-3 and pictures of the life boats used are shown in Figure 6-4 and Figure 6-5.



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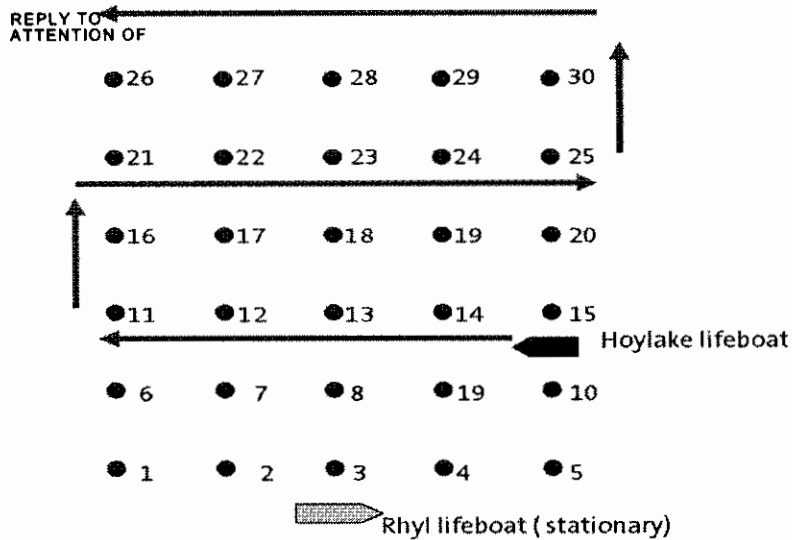


Figure 6-3: MCA small vessel radar detection capabilities schematic

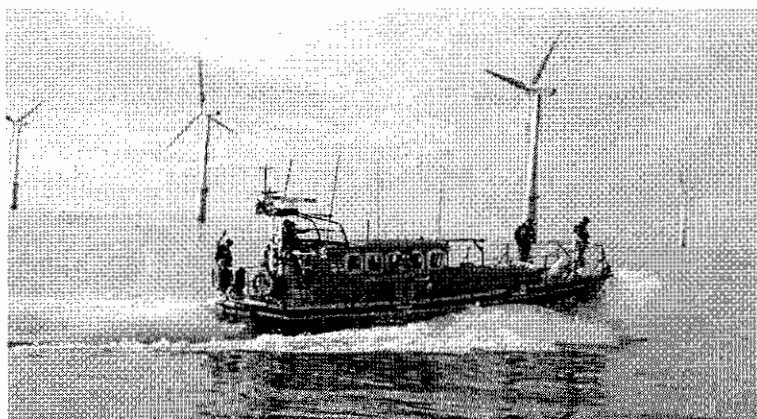


Figure 6-4: The Rhyl RNLI lifeboat "Lady of Hilbre" (top) and the Hoylake RNLI lifeboat "Lill Cunningham" (bottom)



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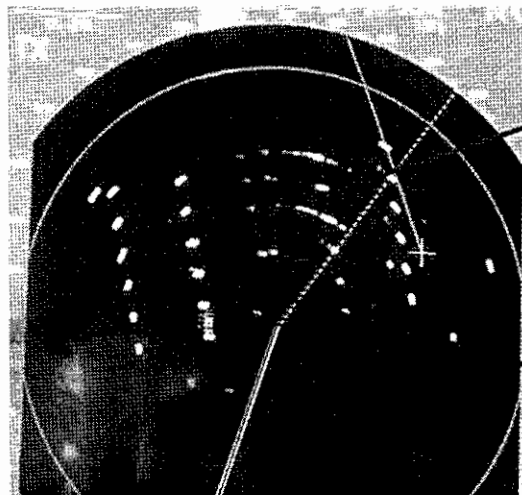
Figure 6-5: The Rhyll RNLI inshore lifeboat

6.3 Results of the trials

6.3.1 Shadow and blind areas

As has been noted previously, the WTGs produced blind and shadow sectors behind them in which other turbines and vessels could not be detected and displayed. An example of this is illustrated in Figure 6-6. Additionally, the strong response of the WTGs when nearby, and with their close spacing, appears to produce saturation areas in which targets are not detected, particularly if receiver gain is reduced to reduce side lobe and other spurious echoes. However, in general, this would only be a significant problem if:

- the search vessel or target were not able to move to different locations from where the target was not in these sectors;
- the target lay within the poor cross and down range discrimination areas of the WTG responses, as illustrated in the following trials.



With gain turned right down to reduce side lobe effects turbines 8, 13, 18, 23 and 28 are in blind areas. What appear to be echoes of these turbines are actually side lobes.

"Lady of Hilbre" lost in blind sector

Figure 6-6: Shadow and blind arcs with side lobe echoes



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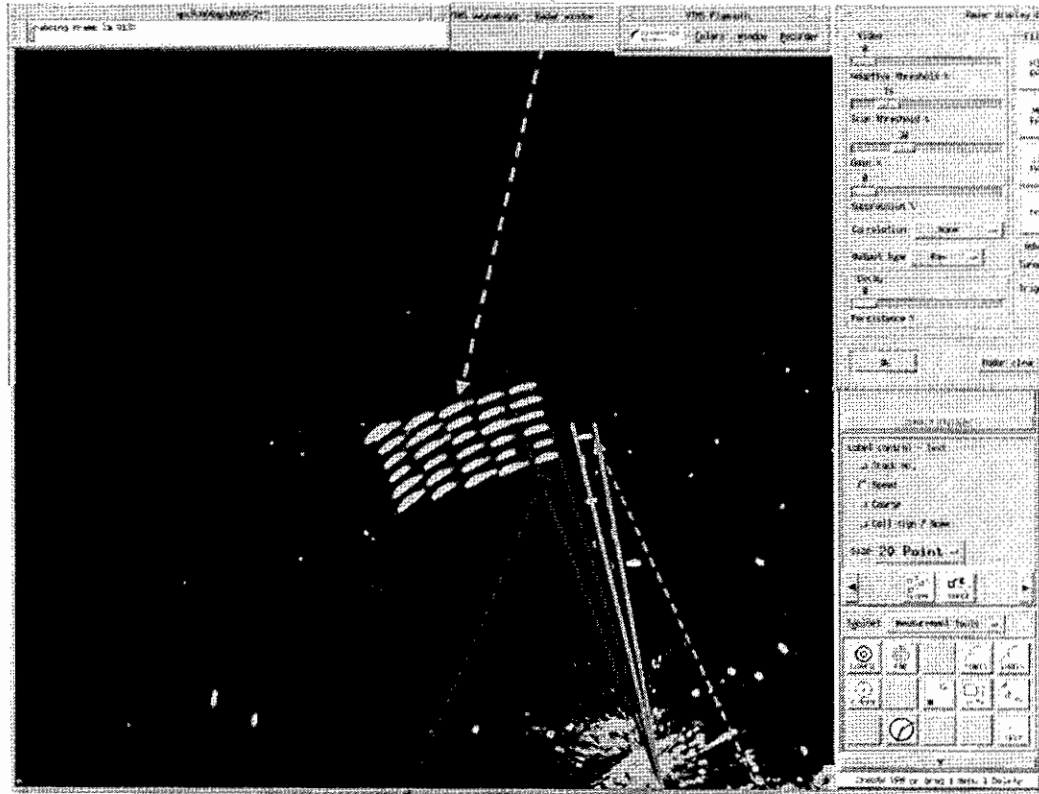
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6.4

Principles of range and bearing discrimination testing

The effect of turbine blades on turbine echo size is illustrated in Figure 6-7, where the plane of the rotor blades is approximately at right angles to the direction of the radar scanner. Here the angular width of the turbine is 1.6 times that of the anemometer mast. Corresponding sizes of the echoes displayed at the relevant ranges are about 610 metres and 300 metres respectively. The displayed size of turbine and anemometer mast is $2 \tan(\theta/2) \times R$, where R is the range in metres and θ is the angle subtended by the displayed echo. The displayed range discrimination is approximately 200 metres.

*Range discrimination determined by
 turbine down-range echo depth measured
 at specified pulse lengths*



(Angles not to scale) **Bearing discrimination of targets close to turbine is determined by theta (angular width of turbine) at a given range.** *Anemometer mast*

Figure 6-7: Range and bearing discrimination



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6.5 Range discrimination test one
6.5.1 Method

With Hoylake lifeboat "Lady of Hilbre" stationary, alongside turbine 1, on its Northerly side, Rhyl lifeboat "Lill Cunningham" maintained a Northerly course towards turbine 1. With the radar initially set on its 6 nautical miles range and using a video recorder, the display was recorded continuously from a distance of 4 nautical miles from turbine 1. Additionally, it was noted whether and at what range, if any, the echo of target vessel "Lady of Hilbre" could be visually resolved from the return from the turbine. As "Lill Cunningham" approached turbine 1 the radar was progressively set to shorter ranges and pulse lengths.

It should be noted that the initial four nautical miles range was chosen since it was a fair representation of the range at which search and rescue activities would be fully under way. The track followed is in Figure 6-8.

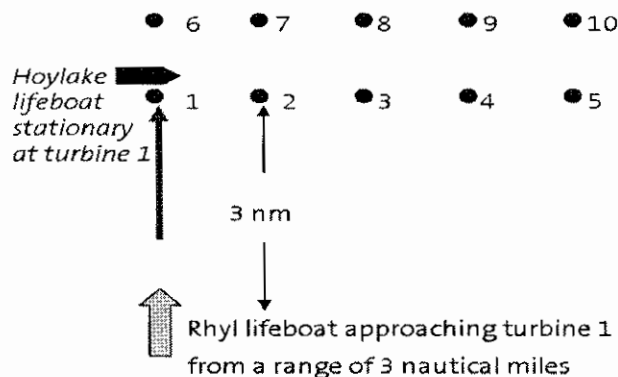


Figure 6-8: MCA range discrimination test 1 schematic

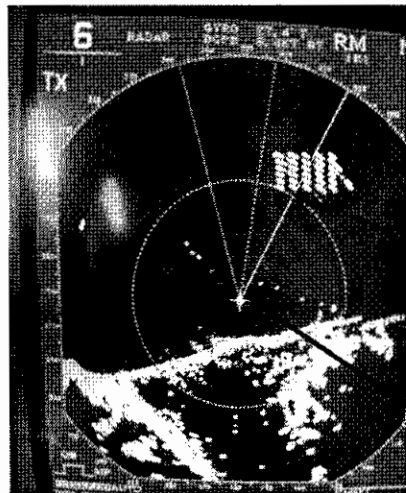
6.5.2 Results of the trial

As the "Lill Cunningham" approached the wind farm, the echo of "Lady of Hilbre" could not be seen to separate from that of turbine 1. This is shown in Figure 6-9. With "Lill Cunningham" 1.5 nm from turbine 1 and "Lady of Hilbre", 30 metres west of turbine 1 and 25 metres down range from it, the radar was put on a 3nm range, short pulse setting. It can be seen (see Figure 6-10) that there is no echo separation. The anemometer mast, approximately 170 metres to the west of turbine 26, is not separated in azimuth from it due to beam width effects.



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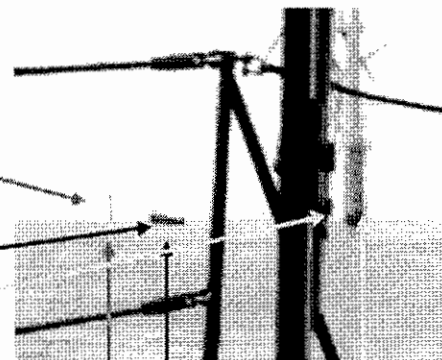
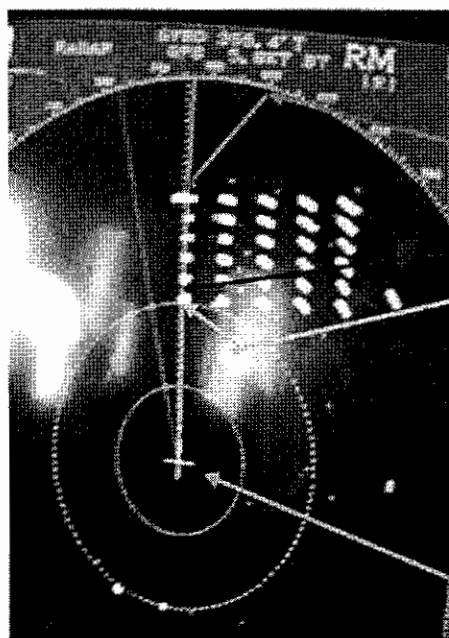
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On medium pulse length at a range of 3.64 nm the displayed down range echo of each turbine is approximately 300 metres in depth. "Lady of Hilbre" not visible behind turbine 1.

"Lill Cunningham"

Figure 6-9: "Lady of Hilbre" in turbine shadow on 6 nm range



Turbine 1

"Lady of Hilbre"

Anemometer mast

"Lill Cunningham"

Figure 6-10: Still in shadow on 3nm range



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6.6 Range discrimination test two
6.6.1 Method

Since there was no down-range separation of the echo of "Lady of Hilbre" from that of the turbine on these radar ranges, then the following trial was carried out with "Lill Cunningham" initially stationary 3 nautical miles to the south of turbine 1, its radar set to the 3 nautical mile range and "Lady of Hilbre" very close to turbine 1. "Lady of Hilbre" headed slowly towards turbine 6, the object being to note where its echo clearly separated from that of turbine 1 on "Lill Cunningham"'s radar . This separation was however not observed. Therefore, a series of runs were performed by "Lady of Hilbre" while "Lill Cunningham" slowly proceeded towards turbine 1. The courses followed are illustrated in Figure 6-11.

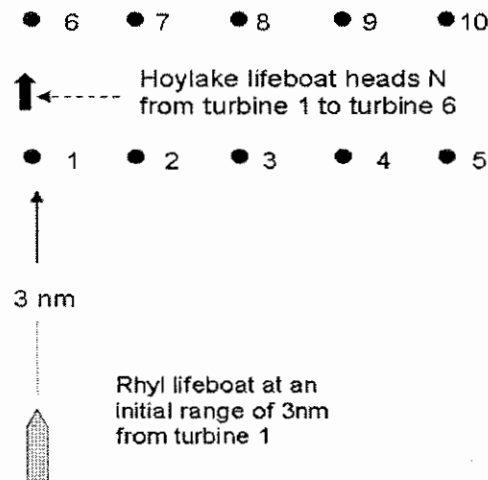


Figure 6-11: MCA range discrimination test 2 schematic

6.6.2 Results of the trial

While "Lady of Hilbre" remained in the shadow of turbine 1, no echo was received. However, when she kept on a line 30 metres to the west of that joining turbines 1 and 6, the echoes separated at a down range distance of some 200 metres from turbine 1, when "Lill Cunningham" was 1.4 miles from turbine 1, radar set to 1.5 miles range, short pulse, and with the gain control turned down to reduce side lobe and reflected echoes. The observed range discrimination is shown in Figure 6-12.



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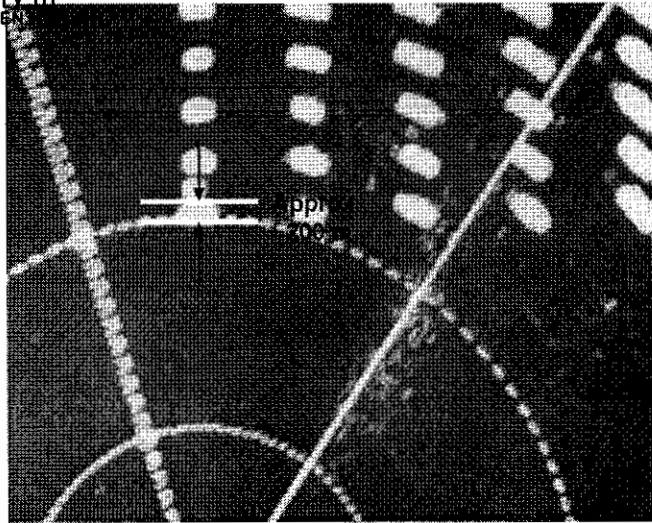


Figure 6-12: Observed range discrimination

6.7 Bearing Discrimination

6.7.1 Objectives and method

The objectives of these trials are similar to those of range discrimination, but in azimuth rather than down range.

Hoylake lifeboat traversing East and West of turbine 1, with "Lill Cunningham" stationary 3 nautical miles South of turbine 1, its radar set to the 3 nautical mile range and "Lady of Hilbre" very close to the northerly side of turbine 1, the size of the cross-range arc of the returned echo of turbine 1 was measured using the radar's bearing markers. The course is illustrated in Figure 6-13.

"Lady of Hilbre" could not be visually distinguished from the echo of the turbine therefore proceeded slowly on a westerly course until its echo on "Lill Cunningham's" radar visually separated from that of the turbine. "Lady of Hilbre" then proceeded on a reciprocal easterly course until its echo on the radar on "Lill Cunningham" again separated from that of the turbine. Radar bearings and ranges of "Lady of Hilbre" were recorded at both of these instances. The full procedure was recorded by video camera. It should be noted that the radar beam width, unlike pulse length, will not vary significantly with the range to which the system is set and thus, the bearing discrimination in degrees will be effectively a constant. Cross-range response widths can be calculated for other ranges from the turbines at which the search vessel ("own ship") may lie (see Figure 6-7).



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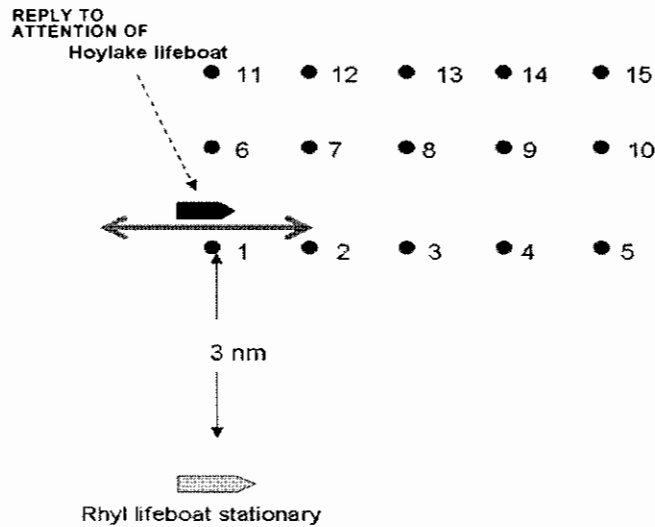


Figure 6-13: MCA bearing discrimination test schematic

6.7.2 Results of the trial

Full separation both west and east of turbine 1 was achieved at an angle of 4 degrees at the observation range of 3 nm. This angle is measured from the centre of the turbine echo to the centre of the target echo and equates to a distance of 388 metres.

It should be noted that the target would only show as a distinct and separate echo when some 385 metres clear of the turbine tower and therefore it would not be detectable for a distance of 770 metres from one side of the turbine to the other. As can be appreciated, the echo of a target travelling through this turbine array would be separate from nearby turbines and trackable by ARPA for only short periods of time and distance.

The results are illustrated in 6-14.



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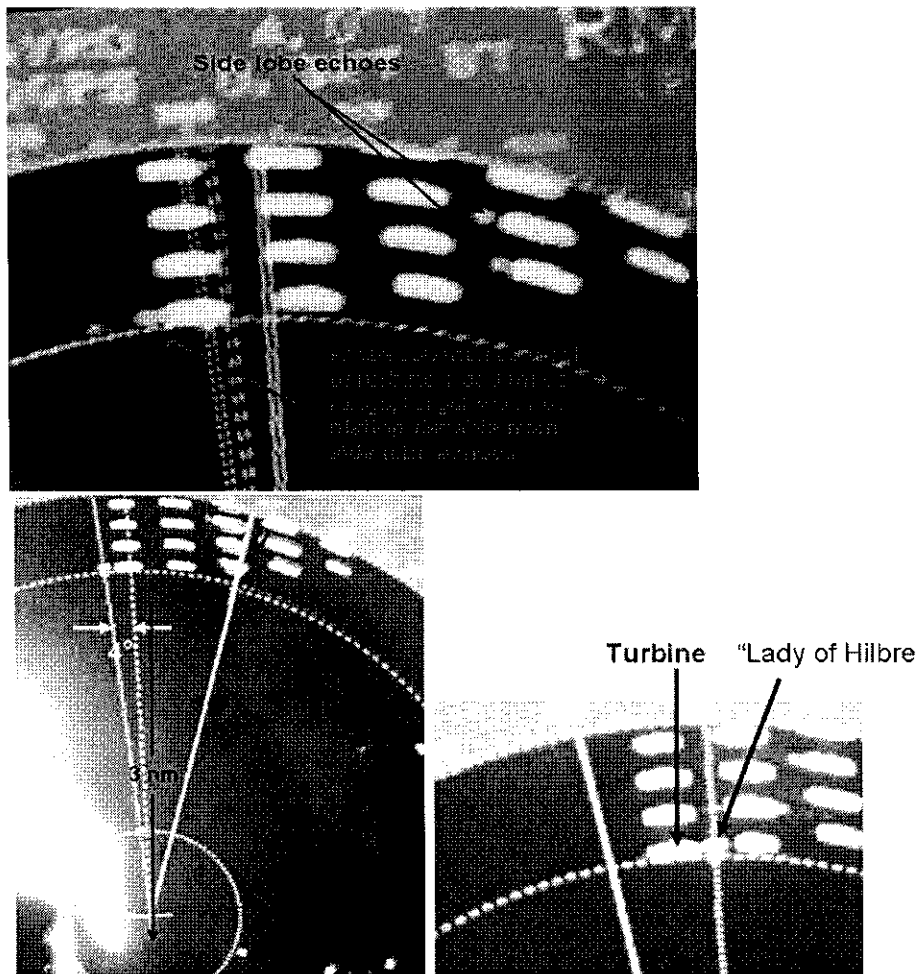


Figure 6-14: Bearing discrimination trials results



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6.8 Down and across range target discrimination

6.8.1 Overview

The problem here relates to the scanner beam width and pulse length in use. Theoretically the across range size (in metres) of a displayed target is equal to its beam width at that particular range from the target plus twice the cross range target size, i.e:

$$W = 2 \tan(\theta/2) \times R_{target} + R_{cross}, \quad 6-1$$

where W is the beam width in metres, θ is the horizontal beam width angle, and R_{target} and R_{cross} are the target range and target cross range sizes respectively.

Echo depth in metres is equal to half the pulse length in microseconds, times the speed of propagation of radio waves, plus the down range depth of the target, which can be expressed as:

$$D_{echo} = (p \times 300/1\mu s)/2 + D_{target}, \quad 6-2$$

where D_{echo} is the echo depth in metres, p is the pulse length in μs and D_{target} is the target depth.

However, the displayed sizes of the North Hoyle WTGs from Gwaenysgor are significantly greater than that, the across range echo size being around 600 metres at a range of 5.2 nm and the down range depth being around 200 metres.

The across range effect is due to the fact that, since the vertical extent of the turbines is large, when the transmitting vessel is close they will return power outside the nominal beamwidth of the radar. That is, the response will include significant power from outside the half power (-3dB) points of the main beam.

This has two effects, firstly that a vessel initially close to the turbine will not be detected until it has moved some hundreds of metres across range or a smaller distance down range. Additionally, the effects of side lobes, shadow and blind sectors and multiple or reflected echoes may compound these ranges.

For ARPA or VTS / Port radar tracking systems the effects are likely to be that tracking vessels within or close to wind farms is difficult. This was found to be the case with the "Norbay" ARPA systems and with the BHP Billiton tracking system at Gwaenysgor.

6.9 Side lobe, reflected and multiple echoes

The objectives of this part of the trials were to examine the potential effects of spurious echoes on target detection and general navigation in the vicinity of the wind farm.

With Rhyl lifeboat "Lill Cunningham" 50 metres WSW of turbine 1, Hoylake lifeboat "Lady of Hilbre" proceeded on a straight line course parallel to the boundary line of turbines 1 to 5 and 50 metres from each turbine, commencing at turbine 5 (as shown in Figure 6-15). "Lill Cunningham" used her radar set to the shortest relevant ranges with normal gain settings and any side lobe, multiple or reflected echo effects were recorded. The results can be seen in Figure 6-16.



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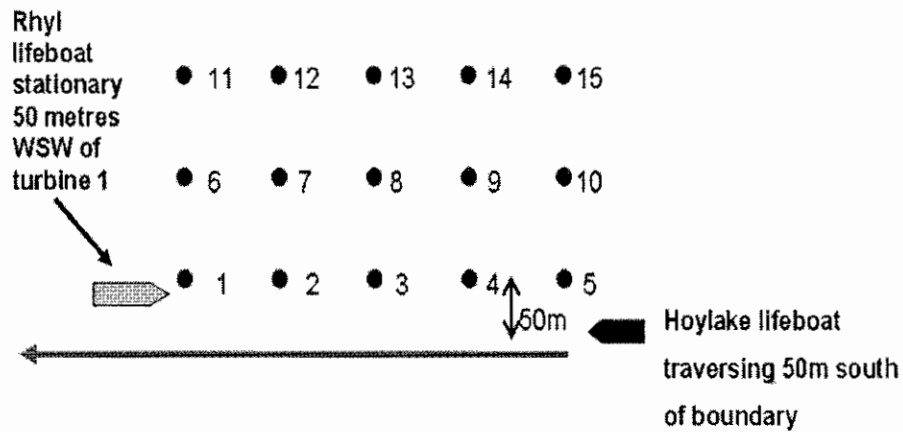


Figure 6-15: MCA Schematic for assessing side lobe, multiple and reflected echo effects

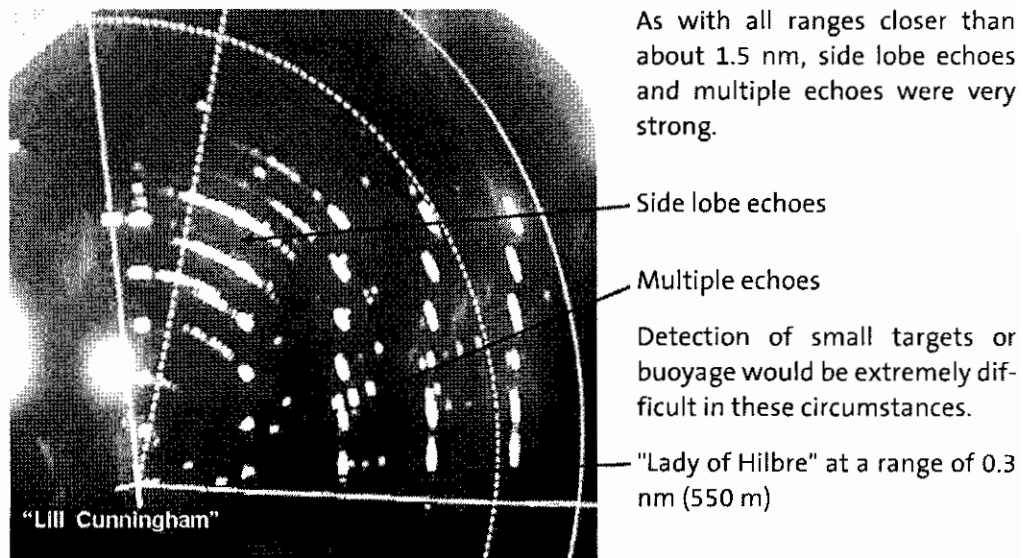


Figure 6-16: Radar on 0.75 nm range and short pulse



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6.10 Further side lobe, reflected and multiple echoes identification
6.10.1 Objectives and method

The objectives of this trial were two fold. Firstly the spurious echoes inside the wind farm were to be examined and secondly the response of "Lill Cunningham" to a shore based radar were to be recorded (see subsection 6.12 for details of this).

"Lill Cunningham" was to proceed north between turbine columns 1 to 26 and 2 to 27. This is shown in more detail in Figure 6-17.

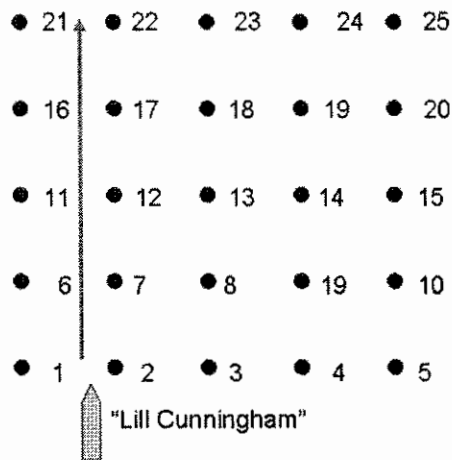


Figure 6-17: Further side lobes schematic

6.10.2 Results of the test

With the set tuned correctly and with proper brilliance levels, the gain control was adjusted to various levels. Within the wind farm it was found that , with the radar set on the 1.5 nm range, ie. a shorter range than the length of the wind farm site, and on short pulse, significant quantities of spurious echoes were produced at all gain levels.

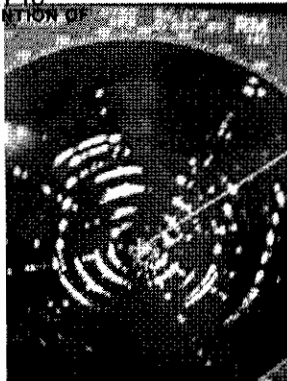
- i With the gain level set higher than its optimum on this range the display was severely affected by side lobe echoes.
- ii, iii The gain control set at its mid level, either manually or by use of the automatic gain control, would be the unit's normal level. Turning gain down to further reduce side lobe or multiple echoes would affect the detection of smaller target vessels or buoyage.
- iv With gain levels approaching zero, side lobe echoes were reduced to a minimum but, with this very low level of signal amplification, small targets and buoyage would be very difficult - if not impossible - to detect.

The photographs in Figure 6-18 illustrate the effects on side lobe echoes of reducing gain manually and that obtained using the automatic gain control. It should be noted that the use of swept gain anti-sea clutter controls would also reduce gain at a specific distance from the observing vessel.

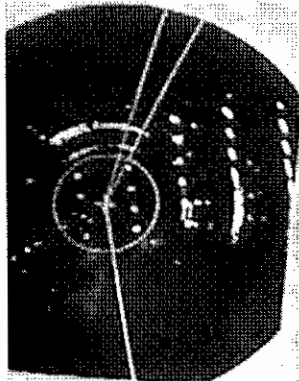


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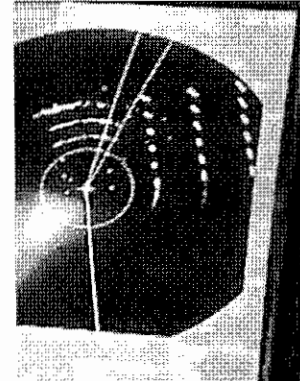
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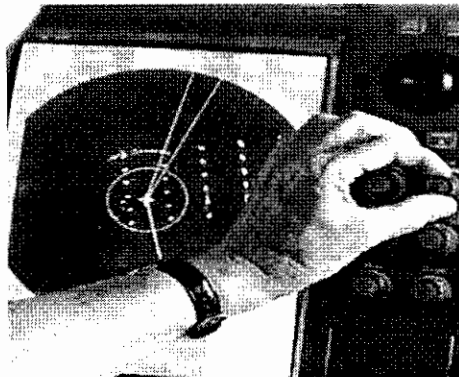
(i) Two thirds gain



(ii) Half gain



(iii) Automatic gain control



(iv) one tenth gain

Figure 6-18: Adjusting gain levels

6.10.3 Summary

Since marine radar scanners are not perfect directional propagators some emissions occur in directions other than the main beam. These are not usually critical unless strongly reflecting surfaces are in close proximity, when spurious echoes may be received from directions other than that of the main radar beam.

These were found to occur in a number of radar systems at ranges of less than 1.5 nm (2800 metres) from the wind farm. This happened in both the X band and S band type tested and approved radars carried in the "Norbay". The effects were greater on S band (See subsection 6.14).

At a range of 0.6 nm (1100 metres) from the turbines "Norbay" reported very heavy spurious echoes on S-band radar.

This effect was also examined on the X band radar of the Rhyl lifeboat "Lill Cunningham". Within the windfarm where the maximum distance from the nearest WTG is always less than 430 metres, the side lobe effect with normal gain levels was very heavy.

This would make the detection of other craft or buoyage difficult, and impossible in some conditions.



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Reducing gain levels would reduce side lobe effects but would also reduce the response of those vessels for which a lifeboat might be searching, or from which other craft might be seeking to keep clear.

The experience of the "Lill Cunningham" was that, to reduce side lobe effects to zero, the gain had to be set at its minimum level. At this level small craft would not be detected, especially if they were close to WTGs (see shadow areas and bearing / range discrimination in subsections 6.2 and 6.4), in rain, or in sea clutter.

Setting the gain control at its mid level or applying the automatic gain control when less than about 500 metres from WTGs resulted in a significant proportion of spurious echoes.

For RNLI vessels' search and rescue (SAR) operations this has obvious implications. For other vessels there could be problems in collision avoidance. This would apply particularly to large or high speed vessels in which there might be a requirement to keep radars on longer range scales and with normal gain levels, when in the vicinity of wind farms, so as to plan required manoeuvres in ample time.

This would apply particularly to vessels within higher density shipping lanes which might be near to larger Round 2 offshore wind farms, and which might have joining or crossing traffic or buoyed waypoints.

MCA have proposed that a research project should be undertaken to look at improvements in the detection and discrimination of small targets, supporting the need highlighted at IMO NAV 50 in June 2004, following high-profile incidents such as the loss of the High Speed Craft (HSC) "Sleipner", in which there were sixteen deaths. It might be possible to use the results of this project to examine the overall effects of offshore wind farms on the detection of small craft, obstructions and buoyage. This could also provide further guidance to the clearance of wind farm boundaries from traffic routes or from critical buoyage and its data could be included in the proposed DTI navigational risk assessment methodology referred to in the Executive Summary

New international standards for type tested marine radars will become available after 2008. The effects of offshore wind farm structures on these will need to be assessed.

6.11 Sea and rain clutter within the wind farm

High winds and swell will produce sea clutter within the wind farm which will itself interfere with the detection of targets. The presence of WTGs against which waves might break may increase the overall sea clutter, which can be reduced by the swept gain control on basic radar equipment. Again, however, the reduction of gain may reduce detection and tracking abilities.

Tripod foundations may produce greater sea clutter than monopiles.

Rain clutter is produced by reflection from water droplets and, again in simple radar systems, its effect is reduced by employing fast time constants (FTC). There is generally a noticeable reduction in detection abilities when FTC is employed. An example of a radar display showing rain clutter near to the wind farm is shown in Figure 6-19.

At all times when the trials were being undertaken, there were light winds, calm seas

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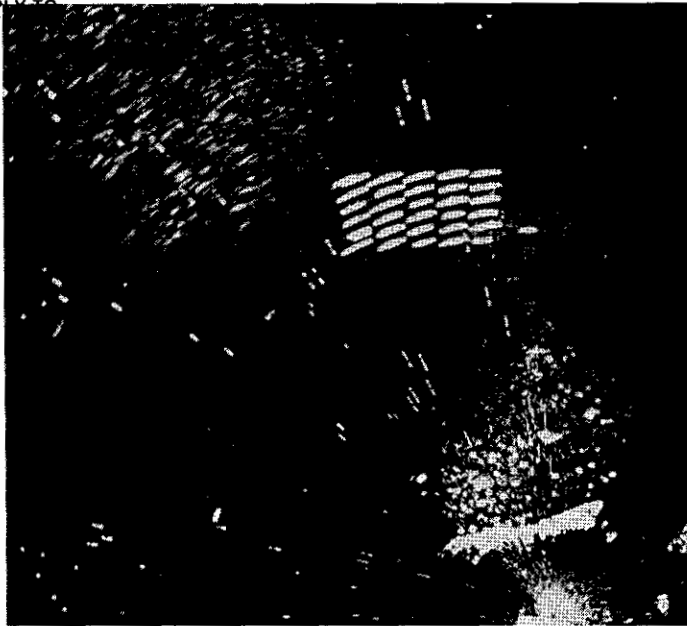


Figure 6-19: Precipitation effects

and clear visibility. This had some advantages in that the vessels involved were able to look at effects close to turbines. However, because of these conditions, the effects of sea clutter and precipitation in combination with the wind farm's own interference effects were not able to be examined.

Benchmarks for the range of first detection in clutter conditions are to be included in the MCA project mentioned above, clutter environments for both sea state and rainfall and as combinations of these being defined.

6.12 MCA tests on the effects of wind farm structures on shore based radars

6.12.1 Overview

The objectives were to inform the operation of VTS and Port approach radar systems in the vicinity of offshore wind farms.

Two radar systems were used in these trials, one being the mobile radar unit kindly loaned to the MCA by the Environment Agency and the other being the radar unit at Gwaenysgor, above Prestatyn. This unit is used by BHP Billiton to monitor traffic around the Douglas oil field and the Hamilton gas field, these being sited some 7.5 nm north of the North Hoyle wind farm.

Raw and filtered radar data were recorded by the Denbridge Marine APX-8000 system.

"Lill Cunningham" and "Lady of Hilbre" carried out the exercises described in the foregoing on July 21st and 22nd 2004, testing their on board systems to determine if they were degraded in any way by the wind farm. During this time, their movements were being monitored and recorded by shore based radars. The shore radar sites were



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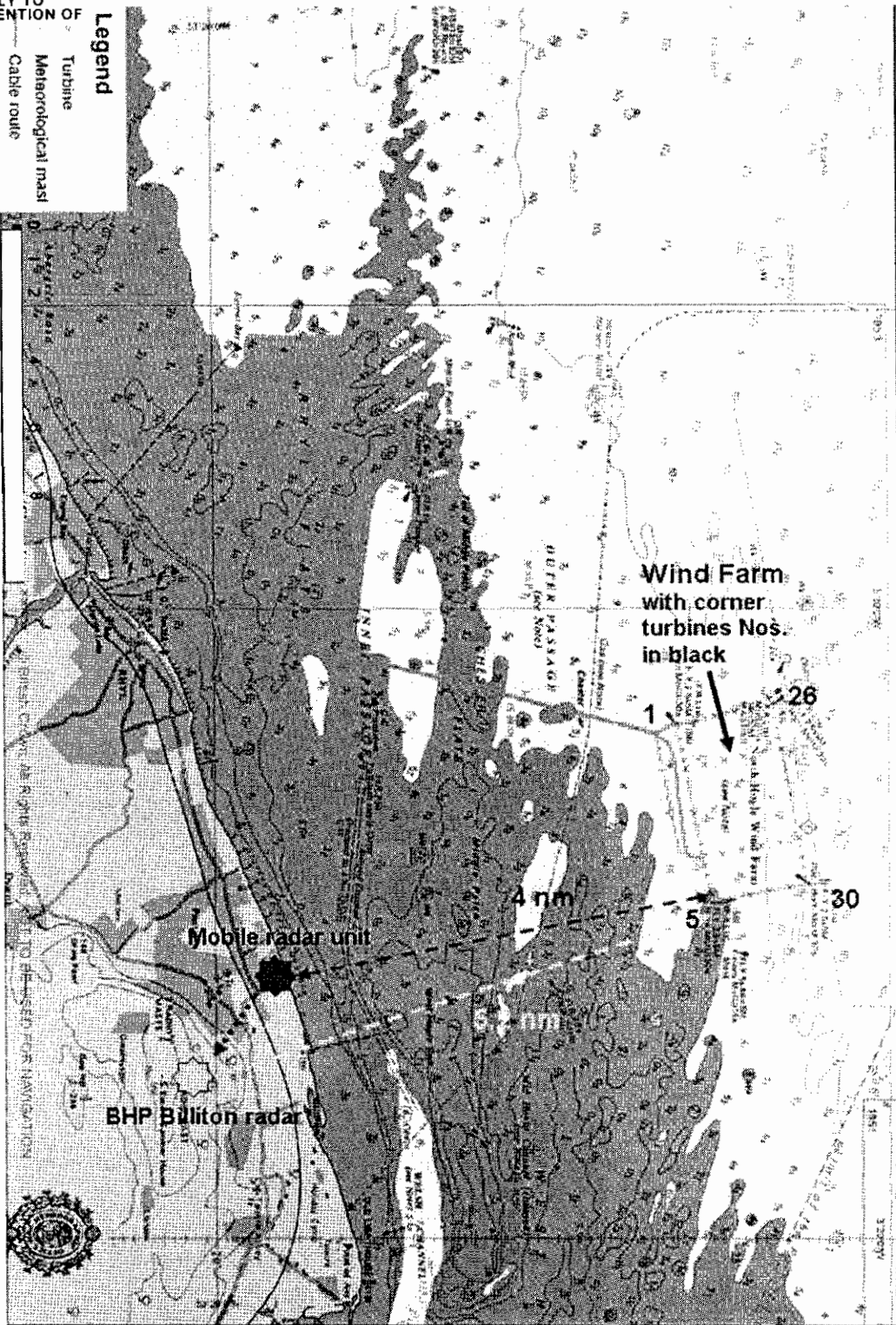


Figure 6-20: North Hoyle wind farm with radar positions (Not to scale)

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as illustrated in Figure 6-20, the mobile radar first being located at a site almost in line with turbine column 5 to 30 and then being relocated near to the BHP Billiton radar. The recording equipment was, on the following day, then transferred from the mobile radar unit to the BHP Billiton unit.

The mobile radar was first sited along the promenade and access road next to the Prestatyn yacht club, where it had a scanner height of approximately 6 metres above sea level and was 4 nm from the wind farm.

6.12.2 Results from the first radar position

The results from the first radar position are shown in Figure 6-21 and Figure 6-22. In Figure 6-21 the radar is on medium pulse and the turbine echoes are displayed as approximately 600 metres in azimuth and 70 metres down range. Whilst in Figure 6-22 the radar is on long pulse and the displayed wind farm echo sizes are respectively 610 metres by 300 metres. The eastern met. mast shows clearly, but with a significantly narrower azimuth than the turbines.

It should be noted that it was very difficult, with the radar at this low height (about 6m above sea level), to detect small targets within the wind farm itself.

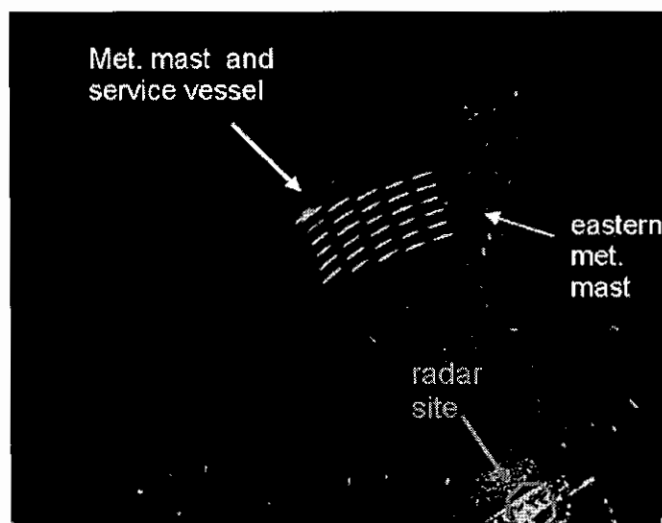


Figure 6-21: Radar is on medium pulse

On the medium pulse length the transmitted power was such that the eastern anemometer mast was only just detectable, but neither lifeboat could be seen on the display. On the long pulse length the turbines were very prominent, but, as with the lifeboats' own radars, the boats could only be detected rarely by the shore radar.

As with the RNLI lifeboat radars, there was no discernable variation in the magnitude of the turbine response with respect to blade disc direction or rotation. Had the blade disc direction varied to a significant extent during the trials, it might have been possible to accurately measure any variations in across range response distances.



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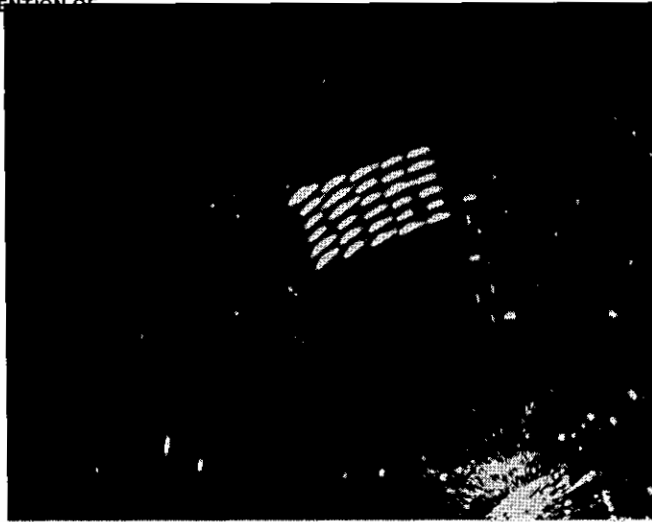
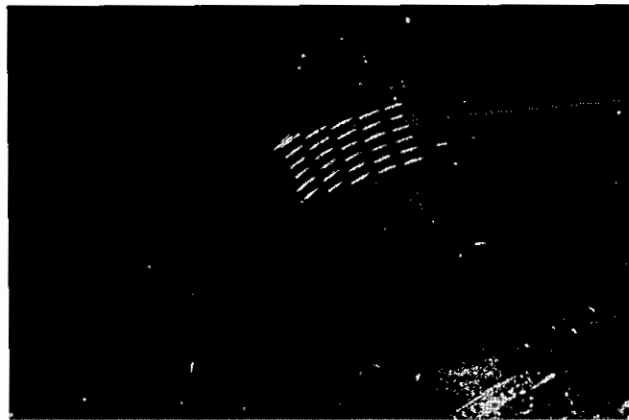


Figure 6-22: Radar set to long pulse length

An example of the detection of the "Lady of Hilbre" is illustrated in Figure 6-23. It can be noted in the figure that the vessel can just be detected between turbines 20 and 25.



The "Lady of Hilbre" can just be detected between turbines 20 and 25

Figure 6-23: Detection of the "Lady of Hilbre"

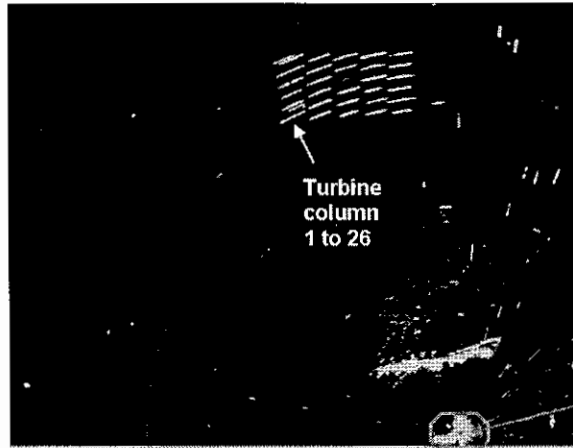


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6.13 Mobile radar at higher location

The mobile radar was then taken close to the BHP Billiton radar site at Gwaenyssgor. At this site it was approximately 200 metres above sea level and 5.2 nm from the wind farm.

In Figure 6-24 it can be seen that the detection of small targets was not greatly improved but the discrimination of the western meteorology mast from turbine 26 and the service vessel immediately south of turbine 6 was apparent.



New mobile radar site
(close to BHP Billiton site)

Figure 6-24: Mobile radar at Gwaenyssgor

6.14 BHP Billiton radar

The radar recording unit was then transferred to the BHP Billiton Raytheon radar unit, close by. The position of this radar relative to the wind farm is shown in Figure 6-25. The displayed sizes of the North Hoyle WTGs from Gwaenyssgor appear significantly greater than theoretical calculated size, the across range echo size being around 610 metres at a range of 5.2 nm and the down range depth being around 200 metres. For ARPA or VTS / Port radar tracking systems the effects may be that tracking vessels within or close to wind farms may be problematic. This was found to be the case with the "Norbay" ARPA systems and with the BHP Billiton tracking system at Gwaenyssgor.

The raw radar image with high persistence level is shown in Figure 6-26. Using a high persistence level the recorded data would, when filtered, detect targets if not directly behind turbines. This is illustrated in Figure 6-27. When target vessel to the North of the wind farm was clear by approximately 1500 metres, its response was increased noticeably, as is shown in Figure 6-28.



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Figure 6-25: Relative Position of BHP Billiton Raytheon radar head at Gwaenyssgor

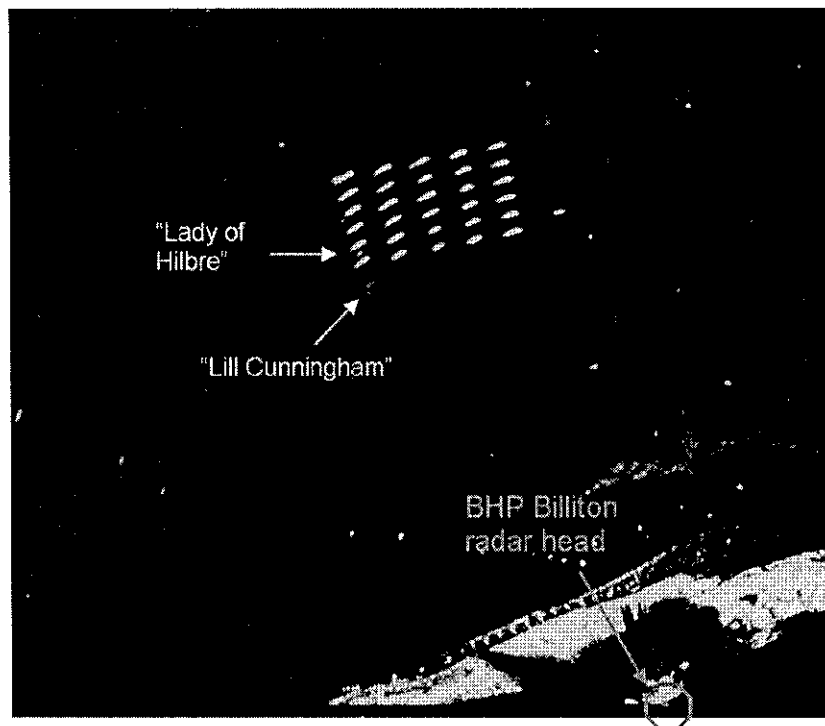


Figure 6-26: Raw radar with high persistence level



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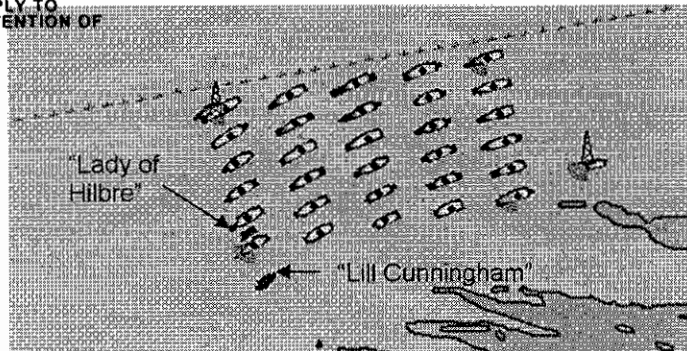


Figure 6-27: Filtered display - high persistence

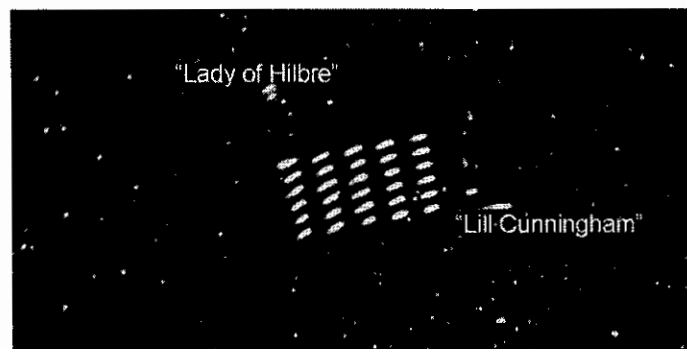


Figure 6-28: Target lifeboats clear of the wind farm

6.15 MCA larger vessel radar detection and ARPA evaluation

6.15.1 Overview

To evaluate the effects of wind farm structures on type-tested radars using larger scanner sizes.

The equipment required for this trial was:

- Larger vessel, with type-tested MCA approved radar equipment;
- Smaller vessel fitted with a radar reflector, carrying out a detection exercise described in the following paragraphs.

In the week following the trials undertaken by the two lifeboats, on July 29th 2004, the P & O passenger / cargo ferry MV "Norbay" was used to make a passage around and through the wind farm. During this time her officers observed the wind farm service vessel "Fast Cat" which was carrying out the detection exercise through the wind farm. The "Norbay" was herself monitored by the Mersey Docks and Harbour Board port radar, sited at Seaforth Dock, Liverpool and by the BHP Billiton radar at Gwaenysgor. The courses followed during the trial are shown in Figure 6-29.



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"Norbay" was fitted with Raytheon X and S-band radars, each with Raytheon M34 Automatic Radar Plotting Aids (ARPA). "Fast Cat" was fitted with a Firdell Blipper 210-7 radar reflector.

"Norbay" also monitored her communications systems, her Automatic Identification System (AIS) and her Global Positioning System (GPS) equipment whilst within and close to the wind farm (see the Masters exercise report in sub-subsection 6.16.3).

"Norbay" has a length overall of 166.7 metres, beam 23.4 metres and 17,464 Gross Tonnage. Two photographs of the "Norbay" can be seen in Figure 6-30. Whilst a photograph of the "Fast Cat" and its radar reflector are shown in Figure 6-31.

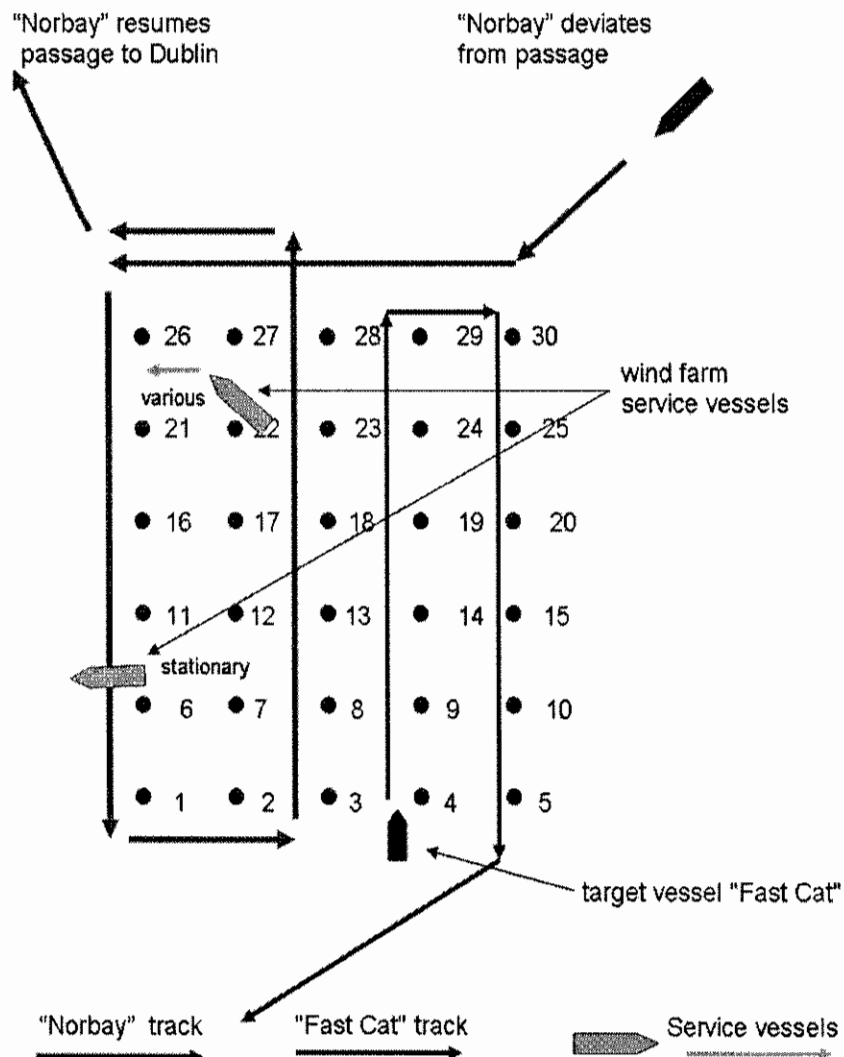


Figure 6-29: Larger vessel trials schematic



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Figure 6-30: MV "Norbay"

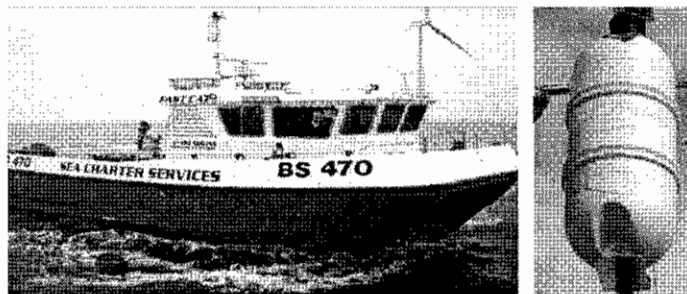


Figure 6-31: "Fast Cat" and its "Blipper" radar reflector

6.16 Results of the Trials

The results are presented in Figure 6-32 to Figure 6-37. In Figure 6-32 the raw radar display as "Norbay" begins to pass at a distance of 800 metres across the northern boundary of the wind farm is shown. Whilst in Figure 6-33 the filtered recording of "Norbay" passing turbine 30 is presented. Note that in both the raw and processed radar displays, strong multiple echoes of turbines are visible.

As the "Norbay" passes turbine 29 multiple echoes are still visible as is shown in Figure 6-34 and in Figure 6-35 as the vessel passes turbine 28. In Figure 6-36 the raw radar display, as the "Norbay" rounds NW corner of the wind farm, shows heavy multiple and reflected echoes.

In Figure 6-37 the filtered display, with high persistence is shown. As the "Norbay" leaves the wind farm it resumes its passage with a hull aspect of about 150 degrees. No multiple echoes are seen at this aspect, but some small reflected echoes are visible.



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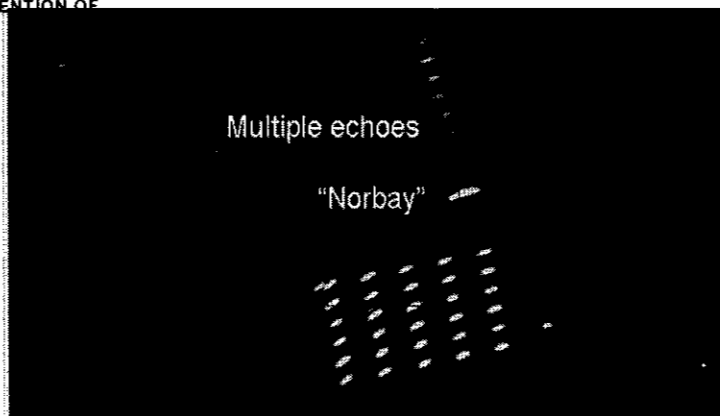


Figure 6-32: Raw radar data as the "Norbay" passes turbine 30 at a range of 800 metres

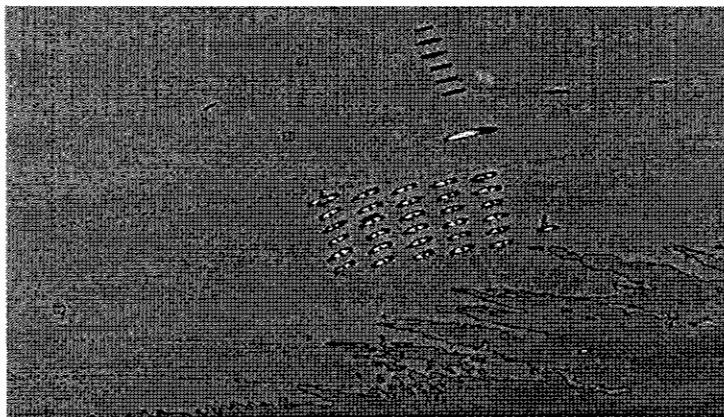


Figure 6-33: Filtered radar data as the "Norbay" passes turbine 30 at a range of 800 metres



Figure 6-34: Filtered radar data as the "Norbay" passes turbine 29



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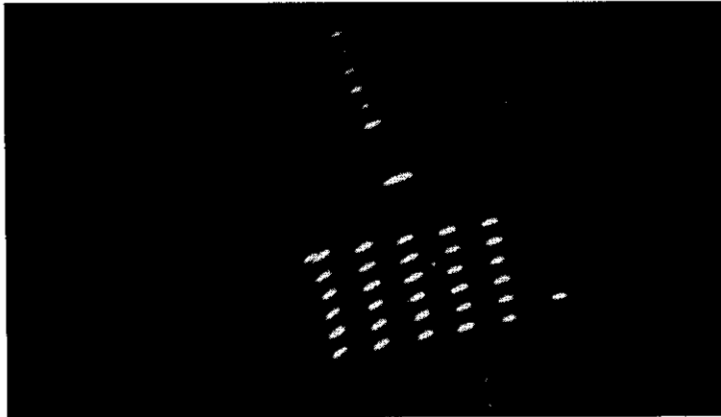


Figure 6-35: Raw radar data as the "Norbay" passes turbine 28

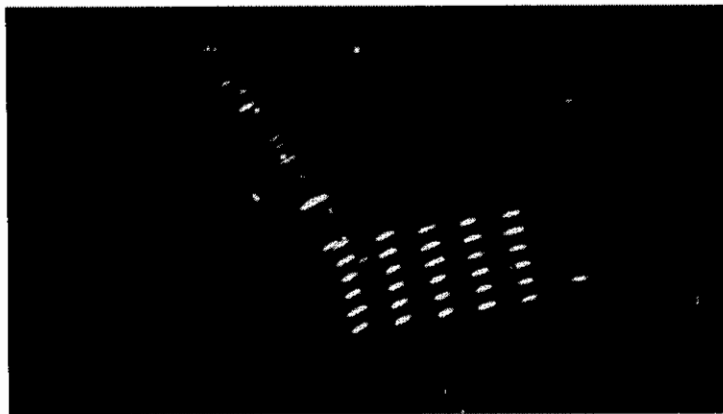


Figure 6-36: Raw radar data as the "Norbay" rounds NW corner of the wind farm

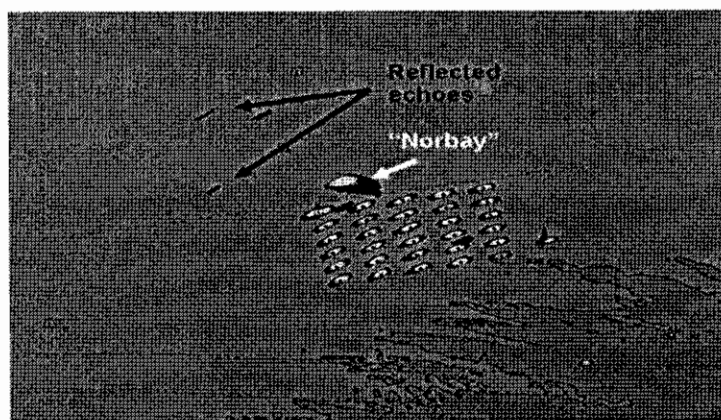


Figure 6-37: Filtered radar data as the "Norbay" leaves the wind farm



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6.16.1 The Mersey Docks and Harbour Board long range radar

This radar, at a range of 14 nautical miles (26 km) from the wind farm, successfully tracked the "Norbay" during her passage around and through the turbine array, with the Norcontrol VOC500 tracking and recording equipment. However, no smaller vessels could be detected or tracked at this range.

6.16.2 Reflected and multiple echoes in general

Since the WTGs are strongly reflecting when vessels and / or shore based radars are close by they can produce significantly interfering reflected and multiple echoes.

Reflected echoes occur when signals are reflected at an angle from one structure to another and returned to the radar via the same route. The latter target will then be indicated on the display in the direction of the initial reflecting surface, and at a range equivalent to the total distance from radar to initial reflector plus the distance from it to the second surface. The target may additionally be indicated at its correct range and bearing.

This effect occurred within the wind farm when signals were reflected between WTGs. Multiple echoes occur similarly when two strongly reflecting surfaces reflect signals backwards and forwards between them, such that echoes of the latter target occur a number of times behind the initial reflecting target, the distance between each such spurious echo being that of the two targets.

This was found to occur with the BHP Billiton radar sited at Gwaenysgor, whose purpose is to monitor traffic in and around the Douglas and Hamilton oil and gas fields. These fields lie 14 nm from the radar site, the North Hoyle wind farm lying in the same direction but only 5.2 nm from the radar site. The Gwaenysgor radar scanner is 200 metres above sea level.

When the P & O ferry "Norbay" was proceeding along the northern boundary of the wind farm and at a distance of around 800 metres from it (as indicated by the radar ranges) very strong multiple echoes were found to occur on its far side (see subsection 6.16) At this time the "Norbay" was almost broadside on to the scanner direction, such that its reflected echoes to the WTGs would be maximum.

Both of these effects may have implications for port approaches, Vessel Traffic Services, search and rescue, and for collision avoidance. As with side lobe echoes, the effects can be reduced by turning down the receiver gain, but again with the penalty of reducing the displayed response of other vessels or buoyage.

For radars used in Vessel Traffic Services, for monitoring infringements, or in port approaches the effects of multiple and reflected echoes may be significant, particularly where a number of vessels may be required to pass or anchor close to a wind farm boundary. However, they may be reduced by the careful siting of shore radars relative to shipping routes and wind farms, or if necessary, by using radars at different sites to resolve ambiguities.

Previous laboratory studies have indicated that there is high potential for such reflected signals to trigger Racons when a turbine is within 1000 metres of them. No Racons



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were at this distance from the North Hoyle turbines and therefore this could not be substantiated. However, if Racons were to be considered for use in marking wind farms, this effect should be determined. Trinity House Lighthouse Service, which maintains a number of Racons, have agreed to investigate this.

6.16.3 Report from the Master, MV "Norbay"

mv.NORBAY

**MCA RESEARCH INTO CLOSE NAVIGATION AROUND
THE NORTH HOYLE WIND FARM.**

Vessel's route : West along North edge of wind farm approx. 300m off line of turbines, South along Western edge approx. 300m off line of turbines then East to midway between turbines 2 and 3 then North between rows of turbines to resume passage to Dublin.

Weather on scene : Light winds, strong ebb tide fine and clear.

| | | |
|----------------------|-------------|-------------|
| Bridge team : | Master | M. Ingham |
| | Rel. Master | J. Moore |
| | Ch. Officer | D. McAuley |
| | 2nd Officer | A. Saulnier |

Radar Types : 1 x Raytheon M34 Arpa 3cm
1 x Raytheon M34 Arpa 10cm

Observations : Internal and external radio communications satisfactory.
AIS fully satisfactory.
All navigational equipment functioned satisfactorily.

Radar observations :

1. On long pulse experienced no definition between close targets.
2. Definition on 3cm radar better than the 10cm set.
3. Experienced difficulties in plotting targets running close to turbines as target swap to larger echo (turbine) occurred before plot had been calculated.
4. Small targets could only be identified when they were at a distance of more than 300m off the turbines.
5. Experienced numerous false echoes close to the turbines when about 1.5 miles off.
6. Echoes of targets on 10cm radar joined up in sweep at a distance of 0.6 miles off.
7. When vessel and targets running N/S along columns of turbines there were no problems experienced in plotting targets with both 3 and 10cm sets so long as the targets remained over 300m from turbines. However, the strength of the echo on the 3cm set faded the closer the target became.



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MCA navigation system trials

7.1 The Global Positioning System (GPS)

Basic GPS operated satisfactorily in all areas near to and within the wind farm with no change in signal to noise ratios, indicating that there was no interference being caused to the UHF satellite signals by the wind farm generators.

The lifeboat crew did report that the Magnavox "Professional" receiver used in the "Lill Cunningham" would not accept Differential GPS signals whilst in the wind farm. The differential transmitter used in this area is sited at Point Lynas, Anglesey, using the low frequency of 297.5 KHz.

However, no other vessel has reported difficulties with the reception of Differential signals and theory suggests that wind farm structures should not affect them. Other vessels have been asked to report any failures.

7.2 Magnetic compasses

No problems with respect to magnetic compasses were reported. However, small vessels with simple magnetic steering and hand bearing compasses should be wary of using these close to WTGs - as of course with any structure in which there is a large amount of ferrous material.

Note : Under the DTI Renewable Energy Fund projects to be undertaken on offshore wind farms and other offshore renewable energy installation (OREI) proposals, the magnitudes and frequencies of electromagnetic and acoustic emissions from such installations will be monitored. These data could also be used to inform navigational and other off-shore concerns.

7.3 Loran C Trial

7.3.1 Trial overview and objectives

The objectives of this trial were to see whether the wind farm structures would affect low frequency signals in general and degrade the use of Loran C equipment in their vicinity.

Since none of the participating vessels carried Loran C, portable equipment was obtained from Trinity House Lighthouse Service and set up on the "Lill Cunningham". A photograph of the Loran C receiver is shown in Figure 7-1 below.

The equipment was set up before entering the wind farm and, during exercises within the farm, connection with various chains was attempted.



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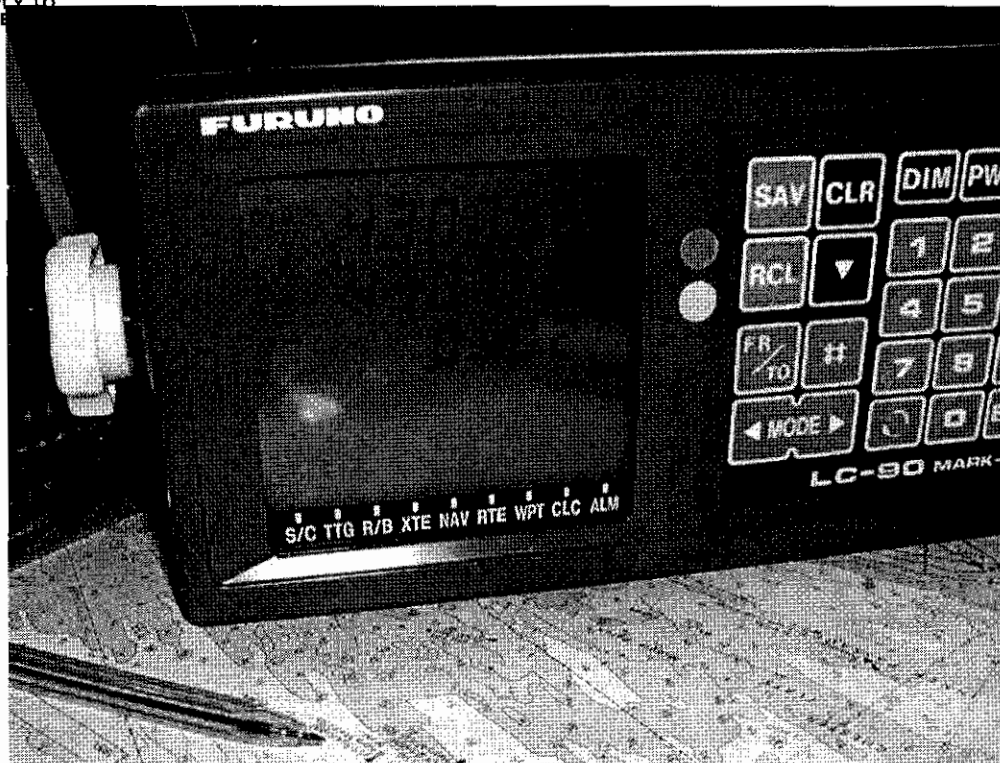


Figure 7-1: Furuno LC- 90 Loran C receiver

7.3.2 Results of the trial

Loran C, which operates at Low Frequency (100 KHz), is - currently at least - the electronic navigation fall back system if GPS were to fail. It was not fitted in any of the vessels used in the trials - being mostly used in ships on and near the US coast, although some GPS receivers have built-in Loran C software - and therefore a carry-aboard Furuno LC-90 system was used in the "Lill Cunningham".

The system failed to operate successfully and could only lock on to the Lessay Chain transmissions. Even here, only one hyperbola could be obtained. This was, however, probably due to operational errors or the closing down of the Loop Head transmitter in the Republic of Ireland, rather than the effects of the wind farm on the received signals.

The signals received jittered as would normally be expected from ground and skywave interference.

7.4 MCA helicopter search and rescue systems

7.4.1 Overview

The aim of this test was to evaluate the capabilities of search and rescue helicopters in detecting and communicating with casualties within offshore wind farms.

The following equipment was required:

- A small vessel fitted with a typical VHF radio (ideally an RNLI vessel);
- A search and rescue helicopter.

A schematic of the trial is shown in Figure 7-2. The helicopter to approach the wind farm from a direction and at a suitable height selected by its crew. The small vessel is to be positioned alongside or very close to a turbine selected by the helicopter crew, diametrically opposite the approach direction of the helicopter. The helicopter crew will attempt to detect the vessel using its radar and to communicate via VHF using a channel selected by themselves, initially when some distance away and until directly over the vessel. The helicopter crew will determine any other trials that they might wish to undertake and that might involve the use of other vessels or shore stations.

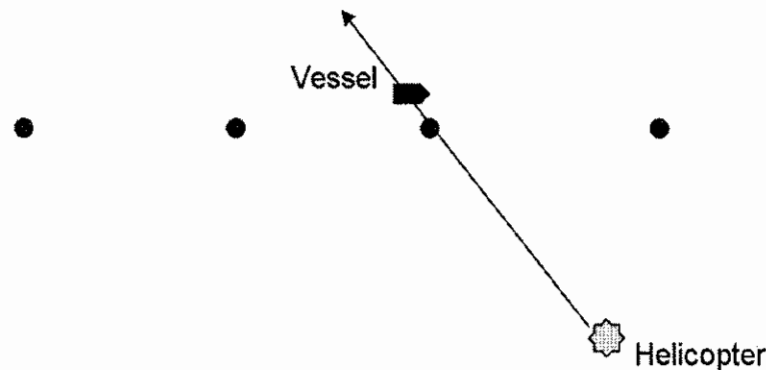


Figure 7-2: Schematic of helicopter radar trial

7.4.2 Results of the trial

There are no trials results as yet. During the original trials period, arrangements were made on three occasions for these to take place. Unfortunately on each occasion the helicopter was called out to other emergency duties and therefore the trials were cancelled.

The Commanding Officer of RAF Valley SAR Flight is keen that the trials should take place and will arrange for this with the Rhyl Lifeboat crew on a mutually convenient date. HM Coastguard Holyhead MRSC will co-operate in setting up these trails.

7.5 Effects of wind farm structures on non type tested radar, communications and navigation equipment

The effects on the majority of recreational vessels and their radar, communications and navigation systems will be similar to those described in the foregoing, but some non type tested systems could be more adversely affected.

During the short period of the MCA trials at North Hoyle no recreational craft were available to take part. However, the Royal Yachting Association (RYA) has asked its members to report any significant data. The letter is shown in Appendix A.

8 Conclusions and recommendations

8.1 MCA trials

MCA's programme was intended to assess the effect of the wind farm structures on marine systems in operational scenarios. The trials assessed all practical communications systems used at sea and with links to shore stations, shipborne and shore-based radar, position fixing systems, and the Automatic Identification System (AIS). The tests included basic navigational equipment such as magnetic compasses.

The effects on the majority of systems tested by the MCA were not found to be significant enough to affect navigational efficiency or safety, and an on-going collection of data on such systems is expected to prove these conclusions.

Some reported effects, such as those on short range radio devices, will be further investigated as will some scenarios which could not be assessed during the trials period, such as helicopter search and rescue operations within wind farms.

The only significant cause for concern found by the MCA during the trials was the effect of wind farm structures on shipborne and shorebased radar systems. It was determined that the large vertical extent of the wind turbine generators returned radar responses strong enough to produce interfering side lobe, multiple and reflected echoes. While reducing receiver amplification (gain) would enable individual turbines to be clearly identified from the side lobes - and hence limit the potential of collisions with them - its effect would also be to reduce the amplitude of other received signals such that small vessels, buoys, etc., might not be detectable within or close to the wind farm. Bearing discrimination was also reduced by the magnitude of the response and hence the cross range size of displayed echoes. If on passage close to a wind farm boundary or within the wind farm itself, this could in some circumstances affect a vessel's ability to fully comply with Rules 6, 7 and 19 of the International Regulations for the Prevention of Collisions at Sea and might also affect the performance of its automatic radar plotting aid (ARPA).

With respect to the multiple and reflected echoes produced when wind farm structures lie between the observing radar and a relatively high sided vessel, gain reduction will have similar effects to those described above. If, as in the trial undertaken, a shore or platform based radar is intended to detect and track traffic in port approaches, Vessel Traffic Systems or in the proximity of offshore oil or gas installations, the effects could be significant.

Recommendations from these trials are that:

- This report should be made freely available to all interested parties.
- Information appropriate to the safety of life at sea, such as recommendations with respect to navigating or carrying out activities such as fishing within or close to wind farms, should be promulgated as necessary by the use of Marine Guidance Notes, Marine Information Notes, Merchant Shipping Notices, etc.
- the siting of wind farm boundaries from recognised marine traffic routes should be determined in consultation with MCA HQ and other stakeholders using a

recommended risk assessment methodology, prior to the submission of consent applications.

- Similarly the location and relocation of fixed radar surveillance systems should be determined in consultation with relevant organisations.
- Further work to be done, as for example identified in the report with respect to adverse weather conditions, helicopter search and rescue operations, short range radio systems, non type-tested systems, etc., should be carried out as soon as practical.
- The results of such research should be promulgated where significant.
- The collation of data with respect to all offshore renewable energy installations (OREI) should be an ongoing activity.

8.2 QinetiQ trials

Four trials, covering the areas of GPS, VHF communications and radar tracking and radar clutter were performed by QinetiQ.

The QinetiQ GPS trial involved traversing previously defined courses through and around the wind farm. Along each course, the number of satellites visible to two different GPS systems (a Garmin 152 and a Garmin GPSIII) and the position of the ship were recorded. Our results show that on average between 8 and 11 satellites were visible at any one time providing accurate positioning to within 5 metres. The effect of wind turbines on VHF communications was investigated by QinetiQ using a hand-held VHF transceiver that was run in series with an adjustable attenuator. A link margin of 1 dB was achieved in free-space (away from any turbines). This required an attenuation of 16dB to be added to the transceiver.

To explore the shadow region behind the wind turbines, four link margins, 2dB, 3dB, 4dB and 5dB were used. These link margins correspond to a total attenuation of 15dB, 14dB, 13dB and 12dB added to the transceiver. The closest approach to turbine 21 was 500 metres and approximately 5m behind turbine 26. As expected the depth of shadow was greater when closer to a turbine. When behind turbine 21 the shadow was found to be approximately 2dB to 3dB lower than the attenuation needed to give a 1dB link margin in free space. For turbine 26 the shadow was deeper due to the closer proximity of the VHF system. It was found that behind turbine 26 the depth of shadow was approximately 10dB below the link margin in free space. The shadow depths are shallower than predicted theoretically confirming the worst case expectations of the theoretical work.

The QinetiQ radar shadowing trials provided very little evidence that shadowing of targets would present any significant problems. In particular the shadowing observed was, like the VHF trials, less than predicted in the theoretical study. Clutter in the radar display due to the presence of wind turbines was found to be quite considerable. Both ring-around and false plots (side lobe and spurious echoes) were observed. The observed problems could be suppressed successfully by using the gain and range settings of the radar. However, this may have the unwanted side-effect of no longer being able to detect some small targets.

8.3 Summary

Most of the effects of offshore wind farm structures on the operational use of marine radar, communications and navigation systems do not significantly compromise marine navigation or safety. Where there are questions about specific systems they will continue to be monitored and assessed when possible.

There are however some concerns about the use of both shipborne and shorebased radar in the proximity of wind farms. Wind farm structures generally have high vertical extents and therefore will return very strong responses when observing radars are close. The magnitude of such responses will vary according to transmitted radar power and proximity to the structures but may affect both the visual detection of targets and the effective operation of automatic radar plotting aids (ARPA).

These effects can be mitigated by vessels keeping well clear of wind farms in open water or, where navigation is restricted, keeping the wind farm boundaries at suitable distances from established traffic routes, port approaches, routing schemes, etc.

With respect to shorebased or offshore platform based systems, the careful siting of radar scanners in relation to traffic routes and wind farm configurations should enable any degrading effects to be minimised.

The overall results are summarised as:

- i Global Positioning System (GPS)
No problems with basic GPS reception or positional accuracy were reported during the trials.
- ii Magnetic compasses
The wind farm generators and their cabling, interturbine and onshore, did not cause any compass deviation during the MCA trials. As with any ferrous metal structure, however, caution should be exercised when using magnetic compasses close to turbine towers.
- iii Loran C
Although a position could not be obtained using Loran C in the wind farm area, the available signals were received without apparent degradation.
- iv Helicopter radar and communications systems
These trials were not carried out due to helicopter call-outs to emergencies on the trial days. The emergency services are keen that they should be undertaken when convenient with the co-operation of HM Coastguard Holyhead MRSC.
- v VHF and other communications
The wind farm structures had no noticeable effects on any voice communications system, vessel to vessel or vessel to shore station. These included shipborne, shorebased and hand held VHF transceivers and mobile telephones. Digital selective calling (DSC) was also satisfactorily tested. The VHF Direction Finding equipment carried in the lifeboats did not function correctly when very close to turbines and the BHP telemetry link was similarly reported to suffer interruptions.

- vi The Automatic Identification System (AIS) carried aboard MV "Norbay" and monitored by HM Coastguard MRSC Liverpool was fully operational.
- vii Small Vessel radar performance.
 - 1. The wind turbine generators (WTG) produced blind and shadow areas in which other turbines and vessels could not be detected unless the observing vessel was moving.
 - 2. Detection of targets within the wind farm was also reduced by the cross and down-range responses from the WTGs which limited range and bearing discrimination.
 - 3. The large displayed echoes of WTGs were due to the vertical extent of the turbine structures.
 - 4. These returned strong responses from sectors of the main beam outside the half power (-3dB) points and the side lobes outside 10° from the main beam.
 - 5. Although such spurious echo effects can be limited to some extent by reducing receiver amplification (gain) this will also reduce the amplification of other targets, perhaps below their display threshold levels.
 - 6. Sea and rain clutter will present further difficulties to target detection within and close to wind farms. Weather conditions at the time of the trials were such that these effects could not be examined.
- viii Shore based radar performance
 - 1. Short range performance (less than 6 nm)

When a small shore based radar was sited such that the height of its antenna was about six metres above sea level, its performance with respect to small vessels was similar to that of the vessel-mounted systems in terms of range and bearing discrimination and target detection within the wind farm.

When moved to a height of 200 metres above sea level there was an improvement in range discrimination.

When the higher powered and narrower beam width BHP Billiton radar was used, at the same height, the visual detection of targets within, and beyond, the wind farm was again improved.
 - 2. Larger vessel detection

A larger vessel was easily detected within and beyond the wind farm. However, while it was broadside on to the direction of the shore radar, reflections from the turbines produced strong multiple echoes. At an oblique aspect to the radar, multiple echoes did not occur, but some reflected echoes were observed.
 - 3. Long range radar (more than 12 nm)

When the wind farm was observed at long range by the Mersey docks and Harbour Board radar the vessel was easily detected and tracked

ix Radar and ARPA carried on larger vessels

As with small vessel radars, range and bearing discrimination were affected by the response from the WTGs. Definition was less on S band radar than on X band. Numerous spurious echoes from side lobes and reflections were reported by MV "Norbay" starting at a range of about 1.5 nm. The ship's ARPA had difficulty tracking a target vessel within the wind farm due to target swop to the stronger response. This substantiated a similar report with respect to the BHP Billiton radar's own tracking system

x Non type-tested radar, communications and navigational equipment

The effects on such systems will be similar to those tested during the trials but will vary individually with respect to transmitted power, antenna performance, radar beam width, etc. The Royal Yachting Association is assisting MCA by providing ongoing information through the experiences of its membership.

A RYA letter

NORTH HOYLE WIND FARM

Assessing effects on recreational craft communications and radar?



PLEASE TAKE PART AND FEED BACK YOUR EXPERIENCES

The RYA is helping the MCA in testing the impact of offshore wind turbines on communication and radar equipment. Whilst they can see the effect on high tech equipment carried on board the MCA vessels, we need to assess the effect on small craft equipment, e.g., VHF, small boat radar, etc.

We have been asked to report back to the MCA the effects on recreational equipment which can only be done by those who use the area - your involvement in this is important.

If you are sailing past the area, please do take part.

Ideally we are looking for two medium size vessels (30 foot) - but reports from individual vessels will also be valuable - fitted with radar and VHF, also Loran C if available. We need the vessels to enter the wind farm area, record the display on their radar - ideally with a digital camera - test VHF communications between vessels and also with the coastguard at Holyhead.

What to do:

- 1 Before entering the wind farm area, please call up the Wind Farm Operations Manager, Mike Bradley (07736631513) to check whether any maintenance vessels are operating. If maintenance vessels are operating please keep 500m clear of them**
- 2) Approaching the wind farm area look at the effects on your radar screen, ideally take a digital picture of them, or sketch them out. If you turn the signal down to avoid distortion of the signal, ensure you would still be able to pick up other small vessels**
- 30 Before entering the wind farm area, call the Holyhead Coastguard, District Controller, Jim Paton (01407767951) and tell him what you are doing and carry out a (VHF) radio check outside the wind farm area. If you have a hand held you may also want to carry out the exercise with this too.**
- 4) Once inside the wind farm area, look again at the effect on your radar screen and report as in (2)**
- 5) Once inside the wind farm area, carry out a second radio check with the Coastguard.**
- 6) If you are sailing with two vessels, get behind the turbines out of direct sight of one another and test radio communications with one another. You can also check to see the effects on your radar.**

- 7) Please also report the type of equipment you have on board (VHF and radar), height of VHF mast, proximity to the turbines when you carried out the recordings.
- 8) Then send your findings back to Susie Tomson (Planning and Environmental Officer) at the RYA either by phone, email or post.

Contact details: Susie Tomson, RYA House, Ensign Way, Hamble, Hants, SO31 4YA. Email Susie.tomson@rya.org.uk . Please call if you have any queries my direct line is 023 8060 4222.

Please feel free to add any other comments on your experience of sailing through the area.

THANK YOU FOR YOUR HELP AND COOPERATION

B Radar specifications

B.1 Environment Agency radar (mounted in Ford Transit van)

Racal Decca Bridgemaster 250 series specifications:

| | |
|----------------------|-----------------------|
| Magnetron peak power | 10kW |
| Frequency | 9410 MHz \pm 30MHz |
| Pulse lengths / prf | 0.05 μ s 1200 Hz. |
| (nominal) | 0.25 μ s 1200 Hz. |
| | 1.00 μ s 600 Hz |

Racal Decca antenna specifications:

| | |
|-------------------------------|----------------|
| Aperture size | 4 ft (1.22 m.) |
| horizontal beam width | 2° (to -3 dB) |
| vertical beam width | 24° (to -3 dB) |
| sidelobes within 10° of beam | -23 dB |
| sidelobes outside 10° of beam | -30 dB |
| Polarisation | Horizontal |
| Rotation speed | 28 rpm |



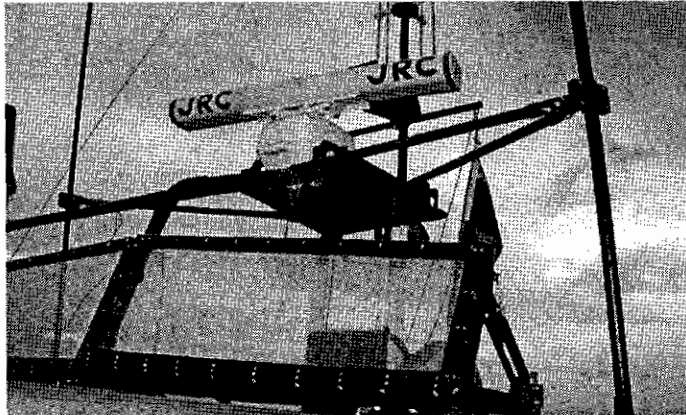
B.2 Mersey class lifeboat radars

JRC JMA 3910 series specifications:

| | |
|----------------------------|---|
| Magnetron peak power | 10 kW |
| Frequency | 9410 MHz \pm 30MHz |
| Pulse lengths (nominal) | 0.08 μ s 0.2 μ s 0.4 μ s 0.8 μ s |

JRC antenna specifications:

| | |
|-------------------------------|-----------------|
| Aperture size | 4 ft (1.22 m) |
| horizontal beam width | 1.9° (to -3 dB) |
| vertical beam width | 25° (to -3 dB) |
| sidelobes within 10° of beam | -23 dB |
| sidelobes outside 10° of beam | -26 dB |
| Polarisation | Horizontal |
| Rotation speed | 25 rpm |



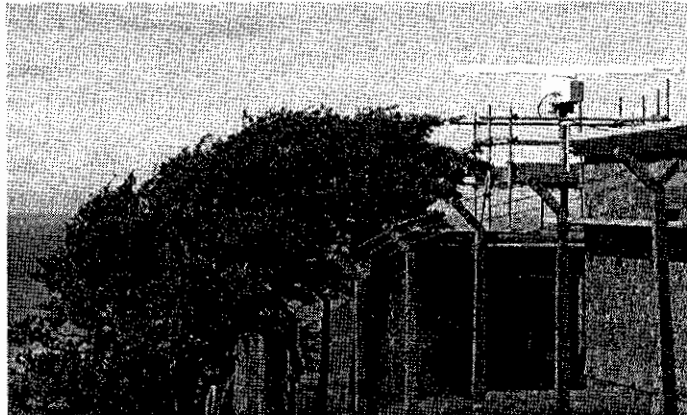
B.3 BHP Billiton Gwaenysgor Radar (ashore above Prestatyn)

Raytheon series specifications:

| | |
|----------------------|----------------------|
| Magnetron peak power | 25 kW |
| Frequency | 9410 MHz \pm 30MHz |
| Pulse lengths / prf | 0.06 μ s 3000 Hz |
| (nominal) | 0.25 μ s 2000 Hz |
| | 0.5 μ s 1000 Hz |
| | 1.0 μ s 750 Hz |

Raytheon antenna specifications:

| | |
|-------------------------------|----------------|
| Aperture size | 12 ft (3.66m) |
| horizontal beam width | 0.7° (to -3dB) |
| vertical beam width | 23° (to -3dB) |
| sidelobes within 10° of beam | -30 dB |
| sidelobes outside 10° of beam | -7 dB |
| Polarisation | Horizontal |
| Rotation speed | 22 / 26 rpm |



B.4 M.V. "Norbay"

Two radars, X and S band, each fitted with Raytheon M34 ARPAs

Raytheon Pathfinder specifications:

| | X band | S band |
|-------------------------------|------------------------------|-----------------------------|
| Magnetron peak power | 25kW | 30 kW |
| Frequency | 9410 MHz \pm 30 MHz | 3050 MHz \pm 30 MHz |
| Pulse lengths / prf (nominal) | 0.08 μ s 0.25 μ s | 0.75 μ s 1.0 μ s |

Pathfinder Antennae specifications:

| | X band | S band |
|-------------------------------|---------------|----------------|
| Aperture size | 7ft (2.1m) | 12 ft (3.66m) |
| horizontal beam width | 1° (to -3dB) | 1.9° (to -3dB) |
| vertical beam width | 25° (to -3dB) | 30° (to -3dB) |
| sidelobes within 10° of beam | -32 dB | -32 dB |
| sidelobes outside 10° of beam | ? | ? |
| Polarisation | Horizontal | |
| Rotation speed | 22-24 rpm | 22-24 rpm |

B.5 Mersey Docks and Harbour Board Port Radar

Uses Norcontrol VOC500 Tracking system

Decca 65160 series specifications:

| | |
|-------------------------------|----------------------|
| Magnetron peak power | 25 kW |
| Frequency | 9410 MHz \pm 30MHz |
| Pulse lengths / prf (nominal) | ? μ s ? Hz |
| | ? |

Decca 65276U Antenna specifications:

| | |
|------------------------------|-----------------|
| Aperture size | 18 ft (5.49 m) |
| horizontal beam width | 0.43° (to -3dB) |
| vertical beam width | 15° (to -3dB) |
| sidelobes within 10° of beam | ? |
| Polarisation | Horizontal |
| Rotation speed | ? rpm |

C Rules extracted from the International Regulations for Preventing Collisions at Sea

C.1 RULE 6 Safe Speed

Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions. In determining a safe speed the following factors shall be among those taken into account:

- (a) By all vessels:
 - (i) the state of visibility;
 - (ii) the traffic density including concentrations of fishing vessels or any other vessels;
 - (iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;
 - (iv) at night the presence of background light such as from shore lights or from back scatter of her own lights;
 - (v) the state of wind, sea and current, and the proximity of navigational hazards;
 - (vi) the draught in relation to the available depth of water.
- (b) Additionally, by vessels with operational radar:
 - (i) the characteristics, efficiency and limitations of the radar equipment;
 - (ii) any constraints imposed by the radar range scale in use;
 - (iii) the effect on radar detection of the sea state, weather and other sources of interference;
 - (iv) the possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range;
 - (v) the number, location and movement of vessels detected by radar;
 - (vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

C.2 RULE 7 Risk of collision

- (a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.
- (b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.
- (c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.
- (d) In determining if risk of collision exists the following considerations shall be among those taken into account:
 - (i) such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change;
 - (ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

C.3 RULE 19 Conduct of vessels in restricted visibility

- (a) This Rule applies to vessels not in sight of one another when navigating or near an area of restricted visibility.
- (b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel will have her engines ready for immediate manoeuvre.
- (c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of Section I of this Part.
- (d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when her action consists of an alteration of course, so far as possible the following shall be avoided:
 - (i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;
 - (ii) an alteration of course towards a vessel abeam or abaft the beam.
- (e) Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until danger of collision is over.

References

- [1] P. P. Shakespeare, *Investigation into the impact of the North Hoyle wind farm site on maritime radio frequency systems*, QINETIQ/S&E/SPS/CR021997/1.0 (2002).
- [2] G. J. Poupart, *Trial plan for EM investigations at the North Hoyle wind farm*, QINETIQ/S&E/SPS/SAF041734/1.0 (2004).
- [3] G. J. Poupart and C. C. Brown, *Method statements for trials at North Hoyle wind farm*, QinetiQ/S&E/SPS041152/2.0 (2004).
- [4] C. C. Brown, "Radar" chapter in *The Marine Technology Reference Book*, Butterworths, ISBN 0-408-02784-3 (1990)
- [5] German Federal Maritime and Hydrographic Agency, *Radar Testing at the wind farm Nysted Havmøllepark, Denmark*, Report No. 6500/10.01/03-S31 (2003)
- [6] Esbjerg Safety Consult A/S. *VHF Radio Communication in Offshore Wind Parks*, Report 04-027 prepared for Energi E2 A/S Denmark (2004)
- [7] Dr. N.Ward, *Effects of Wind Turbines On Maritime Radio Navigation and Communications Systems - Study*, General Lighthouse Authorities technical report 12/NW/04 - Issue 1 (2004)

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Adams, Karen K NAE

From: Robert Busser [robbusser@charter.net]
Sent: Wednesday, November 17, 2004 1:54 AM
To: Energy, Wind
Subject: Cape Wind Project

Dear Sir/Madam,

I am writing to express my strong support for the Cape Wind project. By all accounts the Draft Environmental Report shows that environmental costs of the project are small and the benefits, in my opinion, are enormous, not only in regards to this specific project, but in the precedent it will set for the construction of more wind farms of its kind. Denmark, UK, Spain, Germany are all ahead of us in recognizing and utilizing this valuable energy source. The reduction in atmospheric pollution and possible reduction in natural gas prices are nice, but these, for me, are secondary to the National Security issues at hand. Every time an LNG or oil tanker reaches our shores from the Middle East, millions of dollars go the other way. Some of that money makes its way to Al-Qieda and other organizations to recruit, equip, and train the people shooting at our soldier this very day in Iraq.

We must take all possible actions as soon as we can to set our country on a path to energy independence for the long term. I am planning to spend a week on the Cape again next summer and I hope to see the beginnings of that independence in Nantucket Sound while I am there. We cannot allow a few wealthy yacht enthusiast to delay our progress to the detriment of the many.

Sincerely,

Robert Busser

55 Horse Hill Street
Dunstable, MA 01827

11/23/2004

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Adams, Karen K NAE

From: OILERPAUL@aol.com
Sent: Wednesday, November 17, 2004 7:41 AM
To: Energy, Wind
Subject: comments

dear sirs, my name is paul doherty. i am writing to you, to let you know i am in favor of the cape wind project. sincerely, paul doherty, 300 nathan ellis hwy. #29 mashpee ma. 02649. or p.o. box 2006 teaticket, ma. 02536

11/23/2004

Adams, Karen K NAE

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From: Mark Kibbe [mkibbe@harvesttech.com]
Sent: Wednesday, November 17, 2004 7:34 AM
To: Energy, Wind
Subject: I support the Cape wind project

Hello,

There are no legitimate reasons to not build the wind farm off the Cape coast line. Southern New England should embrace this step towards energy independence rather than complain that the "view" is obstructed.

This project must be allowed to proceed.

(h) (508)866-5322
Mark Kibbe
33 Meadow Street
Carver, MA 02330

161

Adams, Karen K NAE

From: SpyLAT@aol.com
Sent: Wednesday, November 17, 2004 8:49 AM
To: Energy, Wind
Subject: proposed wind farm

Hello,

I am a resident of Central Mass., and I strongly support any attempt at creating a wind farm in our state. Our country is in desperate need of finding other sources of energy. We cannot keep pretending that we can use all the earth's finite resources and not need anything else.

Wind energy is clean, safe, and unceasingly abundant. I know that people are concerned about seeing the windmills offshore. I cannot imagine that these small structures could be more offensive than oil rigs or coal mines or nuclear power plants. Certainly, they are much more pleasant to view than the body of a soldier who has died for oil, or the body of a miner who has died from lung cancer, or the fried body of anyone who has died from a nuclear accident.

If I were to stand on the shore of our ocean and see a patch of windmills way off in the distance, tiny white specks, I would feel a surge of pride that, even in America today, we can make progress.

Please support the wind farm!

Sincerely,

Laura A. Tino
Spencer, MA

11/23/2004

Adams, Karen K NAE

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From: Adam DeVries [adamdevries@msn.com]
Sent: Wednesday, November 17, 2004 10:39 AM
To: Energy, Wind
Subject: Cape Wind Project

To whom it may concern:

I support your idea of building this wind farm. I am always happy when I see that we are reducing our dependence on fossil fuels. I live in Indianapolis, Indiana and hope to be able to vacation some time to this area and take a tour of the completed wind farm.

Thanks,

Adam DeVries
317-485-2907

Get ready for school! Find articles, homework help and more in the Back to School Guide! <http://special.msn.com/network/04backtoschool.armx>

Adams, Karen K NAE

From: Cencar84@aol.com
Sent: Wednesday, November 17, 2004 10:42 AM
To: Energy, Wind
Subject: Nantucket Wind Farm

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November 16, 2004

TO: US Army Corps of Engineers

RE: Nantucket Wind Farm

Dear Engineers,

Please do not allow Cape Wind to visually destroy Nantucket Sound with their proposed wind farm. I do not understand how a private corporation can be allowed to convert public property for private use.

Sincerely,

Sheridan Caery

106 Skyline Drive
Westwood, MA 02090
781-461-8813

11/23/2004

Adams, Karen K NAE

From: Bill Kenney [kenneyjw@comcast.net]
Sent: Wednesday, November 17, 2004 10:46 AM
To: Energy, Wind
Cc: Laura Martin
Subject: Cape Wind Project

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Attached is my letter supporting the Wind Farm Project.

Rgds, Bill

J. W. Kenney
23 Beacon Street
Marblehead, MA 01945
Home (781) 639-2128
Mobile (781) 771-6038

11/23/2004

VULCAN ASSOCIATES (dba)
J. WM. KENNEY
23 BEACON STREET
MARBLEHEAD, MA 01945

PHONE: (781) 771-6038
EMAIL: KENNEYJW@COMCAST.NET

November 17, 2004

via: Email

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Karen Kirk Adams
Cape Wind Energy EIS Project
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Re: Cape Wind Energy Project / EIS

Dear Ms. Adams:

I strongly support the Cape Wind project and I urge the Corps to move expeditiously to complete the review process. Those that oppose the Wind Farm have agendas that are not in the interests of the population in the North East. I have reviewed the summary of the Draft EIS and as an informed person would conclude there are no impacts that should prevent the project from going forward. I have toured the Wind Farms in Europe and seen first hand that they are not noisy, are graceful and attract tourists by land and by water. Thank you for your attention in this matter.

Very truly yours,

J. Wm. Kenney

cc: Governor Mitt Romney
Senator Edward Kennedy
Senator John Kerry

Adams, Karen K NAE

From: Mary Cole [mary.cole@comcast.net]
Sent: Wednesday, November 17, 2004 11:05 AM
To: Energy, Wind
Subject: Regarding Cape Wind

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U.S. Army Corps of Engineers
N.E. District
Attn: Karen Adams
696 Virginia Road
Concord, MA 01742

Dear Ms. Adams,

I am writing in support of Cape Wind and our need locally and nationally to develop alternate energy supplies. The Army Corps of Engineers study seems to agree that there will be very little negative impact, if any, from the wind farm. There will be less overall impact, ultimately, than the recent oil spill on the Cape.

I lived in Concord, MA (Thoreau Street) for 20 years before moving to Norwell on the South Shore. Concord has a small electric generating plant and is able to buy and distribute electricity for the town. Most towns in Massachusetts have no local (large or small) generating plant and must look to regional facilities to purchase power. We need to guarantee that our power is not hostage to the Middle East and that it can be relied upon into the future. I grew up around Buffalo, NY and watched the building of the hydroelectric plants in the Niagara River (Robert Moses and Sir Adam Beck). Massachusetts doesn't have the possibility of hydro plants, either. We do have wind, on shore and off shore. This is a wonderful boon to the state and the region. I am very pleased to see that the Army Corps of Engineers supports this approach to regional energy.

Sincerely,
Mary L. Cole

Mary L. Cole
221 Forest Street
PO Box 320
Norwell, MA 02061
tel: 781-659-4728
cell: 781-264-5728
email: mary.cole@comcast.net

Adams, Karen K NAE

From: Paul Lefebvre [paul@whrc.org]
Sent: Wednesday, November 17, 2004 11:26 AM
To: Energy, Wind
Subject: favorable comments on Cape Wind project

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I've been a resident of Cape Cod for 15 years, and have lived most of my life near the New England shore. I wholeheartedly support the development of the proposed wind farm in Nantucket Sound. I believe we are already behind in taking steps toward a cleaner energy future for both the region and the nation as a whole, and would like to see this project go ahead as quickly as possible.

I believe the opponents of the project are mostly acting in self interest to preserve the view from their exclusive waterfront properties, and do not consider the greater good. They continually point to minor so-called environmental concerns to divert attention from their primary preoccupation - their view. Meanwhile they do not voice any opposition to the unsightly smokestack of the dirty fossil fuel burning power plant on the canal in Sandwich that currently lights their homes, and contributes to the far greater global climate problems caused by using such fuels.

As someone who has made a career in the environmental field, I believe the valid ecological and environmental concerns over the proposed windfarm have been adequately addressed, and that aesthetic opposition should not be weighed heavily in this debate - in the end, the aesthetics of windmills on the horizon is really just a matter of personal opinion, and I find windmills attractive. In my travels I have been drawn to any windmills and windfarms I have encountered - from ancient windmills in Holland to modern turbines in California, there is something I find very fascinating about the interplay of the wind and a mechanical, manmade device that can elegantly generate useful energy from an otherwise untapped natural resource. I, and many others, go there to look at the windmills, take pictures, and tell our friends about them. I personally feel these windmills will be a rare manmade enhancement to the landscape, and already am making plans to use the very same wind they exploit to sail my small sailboat out among them if they are erected.

The opposition ads claim this project will ruin their pristine Nantucket Sound, but the Sound's shores and waters are already far from pristine in part due to the many developments, drainage and septage, and coastal erosion fortifications erected by the very opponents of this project. I doubt people will stop coming to vacation on Cape Cod because of windmills on the horizon and suspect that as in other locations, this project will become a magnet to curious tourists, and generate revenue in areas far removed from the clean power generated.

It is time to move forward. I hope you will allow this project to continue to fruition.

Paul Lefebvre
134 Redbrook Rd.
East Falmouth, MA 02536

Adams, Karen K NAE

From: Kathleen Ralf [ralfk@eastmont206.org]
Sent: Wednesday, November 17, 2004 11:31 AM
To: Energy, Wind
Subject: Cape Wind project

My husband and I have often complained of the black clouds of smoke emitting from our current energy sources: coal and garbage incineration.

We are for having wind power on cape. Driving across country every year has shown us just how beautiful wind power can be. The only concern we have is that a private company might be in charge of the project. Should private companies have control over our water ways to make a profit for themselves, while we are looking for a clean energy source.

Is there a possibility to make it a public company? For example, we live part of the year in Washington state where we have a public utility district. They are in charge of running the dams, etc.

Kathleen and Jim Ralf
217 Barlows Landing Rd
Pocasset, MA 02259

1623 N Western Ave
Wenatchee, WA 98801

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Adams, Karen K NAE

From: Nancy Artz [artz@usm.maine.edu]
Sent: Wednesday, November 17, 2004 11:59 AM
To: Energy, Wind
Subject: support of Cape Wind

109

I am writing in support of Cape Wind. This nation and this planet need renewable energy. I currently buy green tags that support wind energy in the mid-west but we need wind energy in all regions of the nation. No place is perfect, but Cape Wind is as good as we're going to get, and the alternative of the status quo is a crime against nature and society.

Nancy Artz
90 Mill Rd
Cumberland, ME 04021

Nancy Artz, Ph.D., Assoc. Professor of Business Administration
University of Southern Maine, School of Business
P.O.Box 9300, 96 Falmouth St, Portland, ME 04104-9300
207-780-4321(w), 829-6594(home), 780-4662(fax), artz@usm.maine.edu

Adams, Karen K NAE

From: kserdy@adelphia.net
Sent: Wednesday, November 17, 2004 12:06 PM
To: Energy, Wind
Subject: Cape Win d Farm

190

I am all for the proposed wind farm on Cape Cod (Nantucket Sound). We need this kind of energy to lower not only our energy bills, but to also lower our dependance on oil. People opposed to this project are well funded, some of them owners of million dollar ocean front homes. They don't want this project to lower their property values. They leave the rest of us peons on the Cape hostage to their desire to preserve their ocean view. Why shouldn't we have a project that lowers our bills and gives us clean energy? I live in Sandwich MA-home of the Mirant power plant. Not only are they polluting our air, but now they won't even pay the town the taxes it owes. Let's try something new!!! Please allow this project to go forward. Don't cave in to these predominantly wealthy land owners!!

191

Adams, Karen K NAE

From: Curran, Mary Jane [mjcurran@capecod.edu]
Sent: Wednesday, November 17, 2004 12:38 PM
To: Energy, Wind
Subject: Cape Wind project

I am 100 % behind the Cape Wind project.

Mary Jane Curran
work
Cape Cod Community College
2240 Iyanough Rd.
West Barnstable, MA 02668

71 Great Oak Rd.
E. Orleans, MA 02643
maryjcurran@comcast.net

Adams, Karen K NAE

From: SIGHTDOCJAD@aol.com
Sent: Wednesday, November 17, 2004 1:22 PM
To: Energy, Wind
Subject: Wind energy

192

I would like to see the Cape Wind project advance. I'm an outdoorsman, boater, hunter, fisherman; I would like to see our dependence on oil go down but mostly I think this will help us keep a cleaner environment. John A. Duggan

3 Strawberry Hill Rd.
No. Chelmsford MA 01863

SIGHTDOCJAD@aol.com

11/23/2004

Adams, Karen K NAE

From: Sheila [sheila@cataumetboats.com]
Sent: Wednesday, November 17, 2004 1:36 PM
To: senator@kennedy.senate.gov; Energy, Wind; jihn_kerry@kerry.senate.gov; William.Delahunt@mail.house.gov
Subject: Wind Farm

193

I am all for renewable energy but I do not believe the first place to build an offshore wind plant should be in Nantucket Sound. I am asking for the comment period for the Army Corps of Engineers report to be at least 180 days . Such an enormous plan as this needs at least that amount of time to be thoroughly reviewed.

Sincerely,

Sheila Giancola
Cataumet Boats Inc.
www.Cataumetboats.com

Adams, Karen K NAE

From: Samuel Frankel [freezingmoon@mac.com]
Sent: Wednesday, November 17, 2004 1:54 PM
To: Energy, Wind
Subject: Draft Environmental Report & Proposed Project

194

I'm a New England resident (up in Maine, actually) but just in general I'd like to see more renewable energy in this part of the U.S. Maine ends up bearing the brunt of fossil fuel emissions due to the aerial travel of pollutants, so we are affected. Personally, I can't see a downside, and as you're soliciting public comments I thought I'd add mine.

Thanks,

-Sam

195

Adams, Karen K NAE

From: Julie Brooks [jbrooks@ecape.com]
Sent: Wednesday, November 17, 2004 3:48 PM
To: Energy, Wind
Subject: Make Cape Wind a reality

Hello, I am:

Julie Brooks
291 Satucket Road
Brewster, MA 02631

I want Cape Cod to be the birthplace of the offshore wind energy movement. Let's show the rest of the USA that wind energy is a real, viable alternative to foreign oil. I think it will actually increase tourism. I want my tax dollars to go to alternative energy, not to fighting petrodollar-fueled terrorists. Please make Cape Wind a reality.

Julie W. Brooks
President, eCape, Inc.
www.eCape.com
jbrooks@ecape.com
(508)385-0003 x 106

11/23/2004

Adams, Karen K NAE

From: joshua.force@maine.edu
Sent: Wednesday, November 17, 2004 3:52 PM
To: Energy, Wind
Subject: Cape Cod Wind Farm

196

I think a wind farm on the Cape is an excellent move in the right direction towards a cleaner energy production. I support this project and hope your organization will as well.

Joshua Force
645 Congress St.
Portland, ME 04101

Adams, Karen K NAE

From: Alva Hare [alva_hare@yahoo.com]
Sent: Wednesday, November 17, 2004 3:56 PM
To: Energy, Wind
Subject: I support Cape Wind

197

To: Army Corps of Engineers
From: Alva E. Hare
Subj: The Cape Wind Project

I am writing to register my support for the Cape Wind project. I am a Massachusetts resident and registered voter. Let me start by saying that I have written to my congressman, and among other things insisted that the Army Corps of Engineers not be made a political whipping boy.

As we speak the United States is involved in its second oil war. As a veteran of the first gulf war, I feel comfortable in branding it an oil war, while simultaneously supporting and caring about all our men and women in uniform. I do not say that to trivialize their duty, and I hope they are successful at 'freeing' the people of Iraq.

However, that does not change the fact that oil is the very reason that country is significant in the first place. As we speak the United States has spent 200 billion dollars on its second oil war.

Every day the west collectively spends well over a billion dollars on oil, every day. Most of that money goes into the pockets of despots and murderous regimes that kill their own and use that very wealth to plot the destruction of the United States. It is painful to speak in such terms without a hint of hyperbole.

Ending our dependence on foreign oil would not only diminish the threat of terrorism, help to balance our trade deficit, and create domestic jobs. It would also allow us to act out foreign policy that is based on the ideals of the country, not based on the economic need for oil.

The environmental impact statement was no surprise. As someone with degrees in physics and engineering I some amount of technical knowledge. Energy independence has long been one of my interests. I have read extensively on the offshore wind farms in Europe and feel that the environmental impact statement you produced is accurate.

The environmental impact of power generation is staggering. Just last year there was an oil spill in Buzzards Bay Massachusetts. An estimated 15000 gallons of fuel oil was spilled. This fuel was headed to Sandwhich to be used in one of the dirtiest power plants in New England. I urge you to search this out on the web to see shameful pictures of a blighted coast and oil soaked dieing birds. There is always an

environmental impact to power generation. As we speak the beautiful mountains of Appalachia are being flattened by strip mining for coal.

So, oil spills, strip mining, wars, all are associated with power generation. And all of these things leave a lasting shameful legacy for our children. Windmills leave no such legacy. At the end of their usefulness they can be dismantled as easily as they were installed and the coast will quickly revert back to its initial state. The same cannot be said for the strip mined mountains.

If the Wind Farm is stopped, the developer will loose millions of dollars already invested. Other developers in New Jersey, Rhode Island, and Long Island have already said they would probably not go through with their proposed projects in such a hostile environment. So if we allow Cape Wind to be killed, we will effectively be killing offshore wind power in the USA.

The windmills will bring hi-tech jobs to the region. They will help balance the U.S.'s trade and budget deficits. It is an industry we can be proud of. They will help us avoid wars. They will help us distance ourselves from bizarre governments like Saudi Arabia.

Please do everything in your power to assure that the Cape Wind project succeeds.

Thank You
Alva Hare
51 Devens Street, Marlborough, Mass
01752
508-485-9755

Do you Yahoo!?
The all-new My Yahoo! - Get yours free!
<http://my.yahoo.com>

Adams, Karen K NAE

From: Hare_Alva [ahare@microesys.com]
Sent: Wednesday, November 17, 2004 3:57 PM
To: Energy, Wind
Subject: I Support Cape Wind

To: Army Corps of Engineers
From: Alva E. Hare
Subj: The Cape Wind Project

I am writing to register my support for the Cape Wind project. I am a Massachusetts resident and registered voter. Let me start by saying that I have written to my congressman, and among other things insisted that the Army Corps of Engineers not be made a political whipping boy.

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said for the strip mined mountains.

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The windmills will bring hi-tech jobs to the region. They will help balance the U.S.'s trade and budget deficits. It is an industry we can be proud of. They will help us avoid wars. They will help us distance ourselves from bizarre governments like Saudi Arabia.

Please do everything in your power to assure that the Cape Wind project succeeds.

Thank You

Alva Hare

51 Devens Street, Marlborough, Mass

01752

508-485-9755

Adams, Karen K NAE

From: Robert Brown [bob1brown@comcast.net]
Sent: Wednesday, November 17, 2004 4:21 PM
To: Energy, Wind
Subject: Cape Wind

198

Hi,

I have read the summary of your exhaustive report on the Cape Wind wind farm proposal. I agree completely with your findings and that the project should continue. One item that I did not find is timing. We cannot afford to delay while we explore possible better alternatives. To me looking for alternatives is just a delay. We must start now to attack the problem global warming.

Bob Brown
37 Susan Drive
Reading, MA 01867

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Adams, Karen K NAE

From: Robert W. Scott [468central@adelphia.net]
Sent: Wednesday, November 17, 2004 4:30 PM
To: Energy, Wind
Subject: Wind Farm

The Wind Farm in Nantucket Sound should be built as soon as possible for several reasons:

1. It is a non polluting source of needed energy
2. It will use free power of the wind instead of expensive gas or oil
3. It will provide needed jobs for Cape residents
4. It will provide needed power to the network

Opponents have stated:

1. Other sites should be investigated...others were and none are as good as a location in the water for needed wind
2. Federal Government should have the ultimate say in where wind towers are built....The Army Corps of Engineers has been responsible for many major projects over many years
3. Marine traffic will be at risk...no more than with any natural protrusion from the coastal boundary, they will be marked on charts
4. Air traffic will be at risk....no more than radio or TV towers already in use
5. The site is using Government waters and should be licensed....boaters and fishermen already use them without being licensed

There is no real or good reason to wait after the 60 day public comment period.....construction should be started as soon as possible

Robert W. Scott
P. O. Box 365
468 Central Avenue
East Falmouth, MA 02536

Adams, Karen K NAE

From: Dudley Greeley [dgreeley@usm.maine.edu]
Sent: Wednesday, November 17, 2004 5:44 PM
To: Energy, Wind
Cc: ALPadula@aol.com
Subject: Down East, Down Wind, and Down-to-Earth Mainers Love Cape Wind!

Dear Army Corps,

Thanks for releasing the DEIS for the Cape Wind Project and for asking for regional input on the project.

I only read the Executive Summary and some reviews of the complete document but I thank you for a difficult job generally well done. Perhaps the full study addressed how much ecological damage might be wrought, how many birds might be killed, by the alternatives, but this was not mentioned, even briefly in the ES. My personal experience with strip mining and mountain top mining suggests that at least the "alternative" of burning coal to generate electricity kills plenty of wildlife both directly and indirectly and, at least in the mountains of Eastern Kentucky, permanently degrades wildlife habitat. Particular thanks for evaluating so thoroughly the likely air-quality benefits that the project offers over the fossil fuel alternatives. While the risk of a Chernoble-type nuclear event is hopefully low, I remain understandably uncomfortable of such risk and the chronic hazards presented by the mining, processing and storing or treating of spent fuel are also disturbing.

I live in Cumberland, Maine in a 2600 square foot house with a large barn with full electrical service. I buy "green tags" to cover my use of electricity but am fully dependent upon grid electricity for all my electrical power needs.

My total electric bill for last month, including T&D, supply and green tag charges was less than \$13.50. My wife and I, and several sets of dinner guests and other hangers on used just over 100 kWh last month. Our usual monthly bill is about \$15.00. We take care in our use of electricity. We know how it was generated and something of the associated impacts.

We care about the air we breathe, we care about the horrendous impacts of mining (I grew up in a strip and mountain-top mining region in Eastern Kentucky but won't go into details...), we want to be able to eat fish from our rivers and lakes, don't want already stressed spruce at altitude to die from the impacts of ozone or acid rain, and, because we have foster children and a biological child, my wife and I are concerned about the likely serious impacts of global climate disruption and climate change.

Our household is solidly behind the Cape Wind project. We are excited about the prospects of more wind generation capacity being built in New England. I believe that my concern for my childrens' health trump the concerns of some that (horrors!) they might actually see the WTGs if they peer in the direction of the wind park and it is a clear day. I believe that the concerns of well over a million visitors to Acadia National that they be able to safely breathe air with safe levels of ozone and be able to see the view, trump the concerns of some that they might be bothered by what they might see of Cape Wind's WTGs.

As a past long-time member of Maine Audubon (my wife was a board member), and as a naturalist with nearly half a century of active

concern for the planet's other residents, both human and wild, I am confident that the windpark will have a smaller impact on wildlife than virtually any alternative short of significantly more conservative and efficient use of electricity and other resources. Based on my reading of the Executive Summary, it is not clear to me that the evaluations of "Alternatives" included a comprehensive review of greater adoption of energy conservation practices but I believe that American society is unlikely to embrace this option unless our situation gets pretty grim. \$2.00 gasoline hasn't appeared to deter people from driving. I grew up with the coal-mining alternative damn near in my front yard and that process was, and remains, an unmitigated disgrace in most mining regions. My home town of Harlan, Kentucky remains a victim.

In your final draft I encourage more attention to the significant and seriously negative likely impacts of the alternatives to the development of more renewable generation capacity in New England. A few beach front property owners with their noses in the already not-so-clean air might do well to consider how much of "their" beach their grandchildren might lose to melting ice caps if they have their way? How many of their grandchildren they might lose to air-pollution related cancers or heart disease? And I'm sure they're working hard in the meantime to keep their household electricity consumption below 250 kWhs/month!

Regards,

Dudley

Dudley Greeley
University of Southern Maine
Environmental and Economic Sustainability Office
96 Falmouth Street PO box 9300
Portland Maine 04104-9300
Phone: 207-780-4384
Fax: 207-780-4538
Email: dgreeley@usm.maine.edu

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Adams, Karen K NAE

From: William Schwartz [zacsprod@sbcglobal.net]
Sent: Wednesday, November 17, 2004 5:53 PM
To: Energy, Wind
Subject: Cape Wind

Please approve the future construction of Cape Wind. We need this new and clean form of power. It would be crimmminal to let a few people more interested in themselves and their views obstruct the construction of this vital project.

Cape Wind will help us protect our future from being held hostage to Mideast oil and rising oil prices.

Bill Schwartz
ZacsProd@sbcglobal.net

11/23/2004

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Adams, Karen K NAE

From: susanne greene [susanne@wadecottages.com]**Sent:** Wednesday, November 17, 2004 6:02 PM**To:** Energy, Wind**Subject:** Cape Wind

To Whom It May Concern:

I would like to express my approval for the Cape Wind project. I believe we really do need to pursue alternative methods of energy production, given the ill effects of our dependence on foreign oil, and the increasingly ill effects of our energy use on the global climate. The arguments against this project seem to me to be largely "NIMBY" type arguments. These are short-sighted and selfish. We must be more adventuresome and embracing of alternative technologies, or we will continue to harm the earth and be forever stuck in a deliterious energy policy.

Sincerely,

Susanne Greene

35 Shell Street./POBox 211

Siasconset, MA. 02564

11/23/2004

Adams, Karen K NAE

From: Chris Seebald [cseebald@snet.net]
Sent: Wednesday, November 17, 2004 7:11 PM
To: Energy, Wind
Subject: Cape Cod and Cape Wind

Clean energy.

Wind turbines cool.

My wife and I visit the Cape about 4 times a year for the past decade, about a total of 14 days each year. We spend \$700 to \$1800 per visit. Normally, our visits include Nantucket and Outer Cape, rarely, and I do mean rarely, do we visit the Armpit (anywhere SW of Hyannis). If you build them, I will come. Put in the wind turbines, and we'll spend our vacation money there, too. If someone will make it their business to run tourists out to the Wind Farm, I would take the excursion.

Hopefully, the success of the first off-shore wind farm spurs similar projects without the obstructions of the Cape NIMBYisms.

Chris and Sharon Seebald
Ledyard, CT

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Adams, Karen K NAE

From: owlbowel@netzero.com
Sent: Wednesday, November 17, 2004 7:27 PM
To: Energy, Wind
Subject: NO TO WIND FARMS

I HAVE LIVED ON THE CAPE MY ENTIRE LIFE, MYSELF AND OTHER RESIDENTS FEEL THAT THIS WIND FARM WILL DO ALOT OF HARM TO THE AREA BOTH ENVIRONMENTALLY AND FINANCIALLY. THIS IS SUCH A BEAUTIFUL AREA, UNIQUE IN ITS DESIGN FORMED BY GLACIATION A MERE 60000 YEARS AGO. WE SHOULD CHERISH THIS GIFT NOT RUIN IT

ANGRY RESIDENT
Conor D. McInerney
12 skyline dr.
West Yarmouth Ma 02673

Adams, Karen K NAE

From: Peter R Bromer [peterbromer@earthlink.net]
Sent: Wednesday, November 17, 2004 7:43 PM
To: Energy, Wind
Subject: Nantucket Sound wind farm

Dear Decision Maker,

I recently read this article in The New York Times:

A Seashore Fight to Harness the Wind

By CORNELIA DEAN

Published: November 14, 2004

FALMOUTH, Mass., Nov. 13 - Nantucket Sound lies between Cape Cod, Nantucket Island and Martha's Vineyard, some of the nation's best-known vacation spots. Now a private company is proposing to build the world's largest offshore wind power plant right in the middle of it. Depending on who is talking, the results would be either a hideous blot on the landscape or a significant step toward clean power and energy independence.

The argument over the proposal intensified last week, when the Army Corps of Engineers issued a draft environmental impact statement finding few flaws in the plan. But instead of helping to settle the question, the report fed the debate over building there and where - or whether - other wind farms should be built in the nation's coastal waters.

The 4,000-page draft gives new support to environmental groups that praise the project as a safe, nonpolluting and desperately needed alternative to fossil fuel power plants. But opponents challenge the report, the process that produced it and the idea of building the turbine array in the first place.

Regardless of its environmental impact, they say, it is just too ugly - an industrial development that would wreck pristine vistas in a major tourism area. Many add that no offshore energy projects should be considered until the government establishes a better review process for proposals to use federal lands offshore. The project would be the nation's first offshore wind power plant, and it is being closely watched up and down the Eastern Seaboard. A similar proposal is under consideration off Jones Beach, on Long Island, and officials in New Jersey are looking into offshore wind power.

The Corps of Engineers' draft concluded that the project, proposed by Cape Wind Associates of Boston, would not unduly hinder ferry operations, commercial and sport fishing, boating, aviation or other activities at its site, a 24-square-mile area in the part of Nantucket Sound called Horseshoe Shoals. It said the project's 130 support towers, turbines and blades, which together would rise about 420 feet above the water, would not seriously affect currents, waves, water quality, sand movement, fishing conditions or noise levels.

Adequate steps can be taken to protect marine mammals and shellfish, the report said. Birds will fly into the towers and die, the statement says, but probably at a rate of only about one a day, not enough "to cause bird population declines." And while opponents predict that the field of towers would drive away tourists, the corps said the project might actually attract sightseers.

The report is preliminary, and the public will have at least until Jan. 10 to comment on its findings, said Karen Adams, who supervises the permit process for the Corps of Engineers. A final environmental review may be completed as soon as a year from now, she said.

Mark Rodgers, a spokesman for Cape Wind, said the company must still raise capital for the project. But if all goes well, he said, the plant could be producing power as early as 2007. The power would go into the regional grid, not precisely to Cape Cod and the islands, he said. But on a day with average wind, it would produce about 420 megawatts - three-fourths of average electricity needs for the local area.

"Many of the more hysterical fears that opponents had been speaking of in the past three years were not supported in this analysis," Mr. Rodgers said of the impact statement.

But that is no surprise, according to the Alliance to Protect Nantucket Sound, an organization that opposes the wind farm. As is required, Cape Wind paid for the work that went into the report. "As a predictable result," the alliance said, "the document is strongly biased toward Cape Wind."

Ms. Adams and the project's supporters dismiss that criticism. The corps requires applicants to pay for studies of their proposals, she said, because it would not be right for taxpayers to pay for them. The corps independently chose the experts who produced each section of the report, she said, and Cape Wind willingly financed whatever the work the corps requested.

She added, however, that some in the corps did not expect to find themselves in the position of issuing federal permits for the project. "We had to do a lot of learning real quick," she said.

But some officials - including Gov. Mitt Romney, Senator Edward M. Kennedy and Representative Bill Delahunt, whose Congressional district includes the project site, say the project should not go forward yet. They say offshore projects of all kinds need a more systematic federal review process.

Advocates of the wind farm say establishing such a process would only mean unnecessary delay. And several environmental organizations have found themselves in the unaccustomed position of praising the Corps of Engineers, which many have criticized in the past as being too quick to approve development projects.

"At first, obviously, it was pretty frightening because of their history," said Kert Davies, United States research director for Greenpeace, which favors the project. But he added, "I think the effort was very solid, and they were under a lot of scrutiny."

Mr. Davies also dismissed as "an elitist and local view" assertions that the wind turbine array would spoil a pristine environment. Nantucket Sound is far from that, he said, filled as it is with "mega boat traffic and jet skis and fishing boats and ferries - it is not the Grand Canyon these guys are painting it to be."

Others say that regulatory issues aside, the aesthetics are perhaps the biggest issue standing in the project's way. "It's a legitimate concern," said Bruce Bailey of AWS Truewind, a research firm in Albany that consulted on the Cape Wind project.

But, he said, "it's based on expectations, not based on what people have actually seen." He said photo simulations of what the wind farm will look like from shore - it will be 4.7 miles away at its closest point - assume the clearest of weather conditions. Often, he said, the distant view from shore is obscured by haze.

Besides, advocates say, a diminished view is a small price to pay for clean power.

"If we are not willing to accept that tradeoff, I think it says something pretty profound about our priorities and our commitment to moving to cleaner sources of electricity," said Randy Swisher, executive director of the American Wind Energy Association, which represents developers, suppliers, consultants and others in the wind power industry.

The corps's statement did not address in detail another criticism opponents have voiced: that the project is economically viable only because of tax credits or because the federal government is giving the company free use of the site, issues that some say should be considered in a broader federal review of development of offshore lands.

But advocates contend that all kinds of fossil fuel energy projects benefit from federal incentives. And Mr. Rodgers, the Cape Wind spokesman, said that "non-extractive" users of coastal lands - companies that run telecommunications cables and the like - are not required to pay for the privilege. Still, he said, should the federal government decide to require lease payments, the company would "absolutely" pay.

Mr. Rodgers said the site offered several important advantages. It is in the middle of an area whose population - and electricity demands - are growing. And it is a short distance to Barnstable, where power generated by the windmills can feed into the national grid.

Similar considerations are prompting interest in wind power off Long Island and in New Jersey, several experts said. "It's difficult to site a large wind development in the Northeast," Mr. Swisher said.

Advocates of wind power cite Denmark as an example, saying it generates 20 percent or more of its energy from wind, and Mr. Davies of Greenpeace says the record there suggests that offshore wind farms can become tourism destinations. "In Denmark, day sailors take off and sail to these things," he said.

He and others at environmental groups said they hoped the Cape Wind proposal would win final approval and would become the first of many offshore wind projects. "The United States," he said, "is way behind in the clean energy race."

I strongly support going ahead with this project. It is environmentally friendly, and does not waste none renewable resources. It is far off shore and should not hurt the tourist industry, and might actually be a boon to it. All of the photos I have see of wind farms, show them to be very attractive.

I hope the Corps will give its "Stamp of Approval".

Thank you for your consideration,

Peter R Bromer
peterbromer@earthlink.net
13205 NE 3 CT
Miami, FL 33161-3927
(305) 892-8939 Hm
(786) 436-2284 Cell

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Adams, Karen K NAE

From: Jack Hofmann [jackhofm@optonline.net]
Sent: Wednesday, November 17, 2004 8:52 PM
To: Energy, Wind
Subject: Cape Wind Project

US Army Corps of Engineers:

Having seen many windmills off the coast of Denmark, and recognizing the need for new sources of energy, particularly those that use renewable resources, I strongly urge you to complete your review of the Cape Wind project in a timely manner. Utilization of wind energy seems to offer one of the best solutions for renewable energy.

John Hofmann
Watchung, NJ 07069

11/23/2004

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Adams, Karen K NAE

From: Anne Jacoboski [anne@jacoboskifamily.com]
Sent: Wednesday, November 17, 2004 9:04 PM
To: Energy, Wind
Subject: Cape Wind project

Karen Adams, Project Manager
Regulatory Division
ARMY CORPS OF ENGINEERS
696 Virginia Road
Concord, MA 01742

Date Nov. 17, 2004

Dear Ms. Adams,

Please immediately extend the public comment period on the Draft Environmental Impact Statement for the proposed Cape Wind project to 180 days. Any shorter time period is entirely insufficient to allow the public ample opportunity to provide input on such a lengthy and important document on a complex and controversial project.

Thank you for your prompt attention to this matter.

Sincerely,

Anne Jacoboski
Home Owner on Nantucket

11/23/2004

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Adams, Karen K NAE

From: Smilia Marvosh [smiliam@comcast.net]
Sent: Wednesday, November 17, 2004 9:16 PM
To: Energy, Wind
Subject: Thumbs up for Cape Wind

To Whom it May Concern,

As one of the co-founders of the Coalition for the Health of Aggregate Industries Neighbors, I would like to render my favorable opinion regarding the Cape Wind Project on behalf of my organization.

C.H.A.I.N. was formed around local environmental matters that impacted our community in negative ways due to the operations of a once local quarry that was purchased by a multi-national corporation. Through our work here in Swampscott, we became fairly well educated regarding the effects of particle pollution on human health.

I have followed the Cape Wind project closely as I find it to be a really exciting opportunity to put metal to the pedal so to speak accepting stewardship of this beautiful but besieged earth. The assaults on our environment mount daily, and all ecosystems are interconnected - one does not collapse without having collateral effects on adjacent ones, and so on until multiplying bands of collapse will cause more and more threats to all nations, causing worldwide impacts that threaten the security of all nations.

Asthma is the number one cause of school absenteeism throughout the nation, all of us carry a body burden of dozens of environmental toxins, polar bears are being born blind and toothless as a result of chemicals from our polluted airways traveling to their waterways, endocrine disruptors from toxic chemicals in our environment threaten fetal development, and women of childbearing years and pregnant and nursing women are warned to severely limit or eliminate fish consumption due to the mercury being released from coal fired power plants and incinerators. Tens of thousands of early deaths per year mark our industrial and technological advancements, without and equal balance being paid to precautionary principles.

From everything that I have read concerning Cape Wind, there is not a single reason strong enough to delay our accepting responsibility for what we have brought to our lives with not only the local pollutants we continue to put into our air but the overall effects of global warming from all human activity. It is our choice what legacy we leave to future generations, and we are way overdue in stepping up to the plate.

I urge you to facilitate the advancement of the Cape Wind project on behalf of all of us. We all breathe the air - in this we are one.

Sincerely,

Smilia Marvosh
19 Essex Street
Swampscott, MA 01907
781-596-2071

11/23/2004

Adams, Karen K NAE

209

From: ross budd [fastjet@direcway.com]
Sent: Thursday, November 18, 2004 12:23 AM
To: Energy, Wind
Subject: cape wind

Hi. My name is Ross Budd. I have been an air traffic controller for 23 yrs. I am also an ATP rated pilot that frequently flies from NH to ACK. I am also an avid saltwater fisherman with a boat. I see no adverse effects from the wind farm. I support it 100% and hope they can make a lot of money while providing clean energy. Thanks. Ross

11/23/2004

Adams, Karen K NAE

From: Clay Turnbull [turnbull@together.net]
Sent: Thursday, November 18, 2004 9:41 AM
To: Energy, Wind
Subject: Cape Wind

210

TO: U.S. Army Corps of Engineers
N.E. District
Attn: Karen Adams
696 Virginia Road
Concord, MA 01742
P: (978) 318-8828 F: (978) 318-8303

FR: Clay Turnbull
59 N Main St #1
White River Junction VT 05001
turnbull@together.net

Dear Sirs,

I'm pleased to see the results in the "Cape Wind Draft Environmental Impact Statement".

Minimal negative effects of the wind development will be far outweighed by the many positive contributions is now quantified in your report.

I look forward to the wind project moving forward.

Thank you,
Clay Turnbull

Adams, Karen K NAE

From: gary@outercapecsailing.com
Sent: Thursday, November 18, 2004 10:04 AM
To: Energy, Wind
Subject: Cape Wind project

211

To:

Karen Kirk-Adams
Cape Wind Energy EIS Project
New England District
696 Virginia Road
Concord, MA 01742-2751

I am writing to express my strong support for the Cape Wind project in Nantucket Sound. I run a sailing business in Cape Cod Bay called Outer Cape Sailing (Website at: <http://www.outercapecsailing.com>), and have been a Cape cod seasonal and occasional year round resident for 25 years.

Although I don't operate in Nantucket Sound I am affected by the current energy producers including the Canal Power Plant, and Pilgrim Nuclear Power plant in Plymouth. Any clean power supplement or replacement for these dirty, unsustainable power plants would be beneficial. I am directly affected due to the terrible air quality caused by the Canal power plant in Cape Cod Bay. I understand that Cape Cod has some of the worst air quality in the state due to fossil fuel power plants upwind.

In the case of Pilgrim, even the smallest accident or leak would devastate my business as well as much of Cape Cod tourism downwind. An offshore wind farm is far preferable, and has minimal environmental impacts from my reading of your report.

So I urge you to grant approval for this project as soon as possible!

Sincerely,

Gary Flomenhoft, owner
Outer Cape Sailing
Wellfleet, MA
508-237-4012summer
802-578-9218winter

Adams, Karen K NAE

212

From: Wkreid@aol.com
Sent: Thursday, November 18, 2004 10:39 AM
To: Energy, Wind
Subject: Support the Cape Wind Project!

Dear Responsible Official --

Please excuse the "form" letter but I hope it will serve to enlist your support for this Cape Wind renewable, CLEAN energy project.

We need this so desperately it is a shame that it is opposed at all.

Thank you for whatever support you can give to this project which not only protects the environment but will doubtless actually save lives.

Kathleen Reid

Adams, Karen K NAE

From: [ktuthill@earthlink.net]
Sent: Saturday, November 20, 2004 2:00 AM
To: Energy, Wind
Subject: the Rhode Island stance

213

--- ktuthill@earthlink.net

--- EarthLink: It's your Internet.

Dear Army Corps

I am taking this time to write to you because so many people in my area support wind energy, but never seem to get around to actually writing about it. I am very busy just now, but feel that I must speak for those who have voiced their opinion to me.

We here in Rhode Island are ardent supporters of the Cape Wind project. When I say we, I mean virtually everyone that I come into contact with, and there are no exceptions.

Why would there be such strong support coming from this region? Here are my reasons:

1) People here have not been exposed to the derogatory invective put forth by the special interest group known as "Save our Sound". We have not been exposed to advertising from either side and see the issue in its purest form.

2) We do not have a group of wealthy second home owners screaming "Not In My Back Yard"!

That won't happen until they try to do a project here. When that time comes, the proximity to the number one source of air pollution in the entire Northeastern United States will work in favor of wind power proponents. Unlike Cape Cod, the Brayton Point coal fired power plant is visible to most Rhode Islanders. It is much easier to educate people when the dangerous alternative is in plain sight.

3) Last but not least, the Capewind project would likely mean jobs for Rhode Islanders as Tillitson Pearson Industries (TPI) located in Portsmouth R.I. makes blades for wind mills. Our jobs would be short term when compared with the excellent long term opportunities available to Cape cod residents involved with Capewind, but we would still benefit.

So, that is why thousands of Rhode Islanders support Capewind. Please use your influence to help bring prosperity to our region by supporting Capewind.

Thank you,

William Tuthill, Jamestown, Rhode Island

214

Adams, Karen K NAE

From: Chip Bishop Communications [chip@chipbishop.com]
Sent: Saturday, November 20, 2004 4:02 PM
To: Energy, Wind
Subject: Extend Comment Period

To the Army Corps of Engineers:

Please extend the public comment period on the Cape Wind project to 180 days to give the public adequate time to digest and review the preliminary impact statement - especially during the holiday period.

Thank you

Charles Bishop

CHIP BISHOP COMMUNICATIONS & MANAGEMENT, INC.
44 COVE ROAD
WEST DENNIS, MA 02670-2104
Phone 508 398-1997
Cell 508 292-3536
Fax 508 398 0094
chip@chipbishop.com
www.chipbishop.com

11/23/2004

215

Adams, Karen K NAE

From: georgia neill [geornei@msn.com]

Sent: Friday, November 19, 2004 8:52 PM

To: Energy, Wind

To Whom This May Concern:

As a resident of Cape Cod, I am writing to express my strong support for the proposed Cape Cod wind farm. The benefits of clean, renewable energy, as well as job creation, far outweigh any negative impact. We cannot continue to pollute the environment. For the sake of our planet and her inhabitants, we must use alternative forms of energy, such as wind. It will be a crime against nature and humanity to not proceed with the proposed wind farm.

Sincerely,

Georgia Neill
PO Box 806
No. Truro, Ma.

508-487-7591

02652

11/23/2004

Adams, Karen K NAE

216

From: tom catino [tomcatino716@yahoo.com]
Sent: Sunday, November 21, 2004 12:53 AM
To: Energy, Wind
Subject: Wind Energy / Hydrogen co-ops

November 17, 2004 09:00 AM US Eastern Timezone

Wind Energy Cooperatives to Produce Electricity and Hydrogen for the Residential, Commercial and Transportation Industry Nationwide

CHICAGO--(BUSINESS WIRE)--Nov. 17, 2004--U.S. Wind Farming, Inc. (Pink Sheets:USWF):

-- U.S. Wind Farming, Inc. will install the "Next Generation" of Integrated Renewable Energy Systems utilizing Decentralized Hydrogen Technology. This will become an important application for the Nation's Agricultural Community providing a considerable economic base while going far in removing this nation from dependence on foreign oil.

U.S. Wind Farming, Inc. (Pink Sheets:USWF), "America's Only Publicly Traded Wind Energy Company," (www.uswindfarming.com) announced their plans today to commission the Advanced Technology of GE Wind Turbines and Stuart Energy's Proprietary Integrated Hydrogen Generation Water Electrolysis Technologies. This is to provide U.S. Wind Farming's Wind Energy Cooperatives the ability to produce Commercially Viable Renewable and Clean Energy Commodities (Electricity & Hydrogen) thus "Unlocking" Substantial New Renewable Energy Reserves Nationwide.

U.S. Wind Farming announces the next generation of Wind Farming Technologies creating not only electricity for sale during Peak Load Requirement times, but then producing Hydrogen for sale during off-peak times. This provides U.S. Wind Farming with the ability to "Harvest the Power of the Wind" to create valuable commodities garnering prime prices during all times of wind generation. This also allows U.S. Wind Farming to establish Wind Energy Electricity/Hydrogen Cooperatives nationwide in areas previously thought to not be viable candidates for wind energy development because of reduced wind velocities.

U.S. Wind Farming expects to commission GE Wind Energy (www.gewindenergy.com) to install and maintain all Wind Turbines for their Wind Energy Electricity/Hydrogen Cooperatives nationwide.

U.S. Wind Farming expects to commission Stuart Energy (www.stuartenergy.com) to install and maintain all Hydrogen Production/Pressurization/Storage and Dispensing equipment for their Wind Energy Electricity/Hydrogen Cooperatives nationwide.

Existing wind farms and new wind energy capable sites for these revolutionary new Wind Energy Electricity/Hydrogen Cooperatives have approached U.S. Wind Farming. Initial sites under consideration for development are located in California, Hawaii, Nebraska, North Carolina, New York, Tennessee, Oregon, Colorado, Wisconsin, South Dakota, North Dakota and Iowa.

11/23/2004

U.S. Wind Farming, Inc. states that with the advent of this new paradigm of energy production, their Wind Energy Electricity/Hydrogen Cooperatives will not only provide extreme gains for our environment which is attractive to all the inhabitants of this Planet, but they have developed a way for Wind Energy to compete with all aspects of the fossil fuel industry, while providing considerable financial gain to the company and local farming communities. The company states that their Wind Energy Electricity/Hydrogen Cooperatives will go far in removing this nation's reliance on foreign oil.

ADDITIONAL NEWS:

U.S. Wind Farming, Inc. has entered into a development contract for a 100-Megawatt Wind Energy Electricity/Hydrogen Cooperative in the Baltic Sea region of Poland.

U.S. Wind Farming has entered into a development contract with two new Wind Energy Electricity/Hydrogen Cooperative sites in China.

U.S. Wind Farming has entered into a development contract to provide and operate a Hydrogen Cooperative attached to a 350-Megawatt Gas-Fired facility in upstate New York.

U.S. Wind Farming has approached Aruba, St. Croix and several other Caribbean Islands to install Wind Energy Electricity/Hydrogen Cooperatives. Final negotiations and contracts are forthcoming.

The Company relies upon the Safe Harbor Laws of 1933, 1934 and 1995 for all public news releases. Statements, which are not historical facts, are forward-looking statements. The company, through its management, makes forward-looking public statements concerning its expected future operations, performance and other developments. Such forward-looking statements are necessarily estimates reflecting the company's best judgment based upon current information and involve a number of risks and uncertainties, and there can be no assurance that other factors will not affect the accuracy of such forward-looking statements. It is impossible to identify all such factors. Factors which could cause actual results to differ materially from those estimated by the company include, but are not limited to, government regulation; managing and maintaining growth; the effect of adverse publicity; litigation; competition; and other factors which may be identified from time to time in the company's public announcements.

Contacts

U.S. Wind Farming, Inc., Chicago
William L. Telander, President, CEO
800-853-6768
info@uswindfarming.com or <http://www.uswindfarming.com/>

Do you Yahoo!?
The all-new My Yahoo! - Get yours free!

Adams, Karen K NAE

217

From: Kuehnawk@aol.com

Sent: Sunday, November 21, 2004 12:56 PM

To: senator@kennedy.senate.gov; Energy, Wind; john_kerry@kerry.senate.gov;
William.Delahunt@mail.house.gov

Subject: (no subject)

Please, please help Save Our Sound. I just can't believe this Cape Wind proposal has gone as far as it has. The whole thing is entirely unbelievable. The waters off Cape Cod are one of the nation's prized assets. Cape Cod and environs should be protected at all costs. Thank you.

Sincerely,

Andrea Kuehn
3 Stephen Lane
West Dennis, MA 02670-2109

11/23/2004

Dear Mr. Edwards,
 I support an extension of
 the comment period from 60
 days to 180 days in order to
 fully review the A.E. of
 DEIS on the Cape Wind
 Project.
 Sincerely,
 Sheldahl Valentin

218
 11/19/04

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive
 4,000-page Cape Wind Draft Environmental Impact Statement document.
 I respectfully request that you extend the review period to 180 days in order
 for the public to be as best informed as possible and provide you with thoughtful
 and unhurried input on this precedent-setting project.

219

Sincerely,

Mary Ehlers

Print Name

Mary Ehlers

Address

423 St. Andrews Drive

City

RECEIVED
 NOV 19 2004
 REGULATORY DIVISION
 Date 11/17/04

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Dear Army Corps of Engineers:

221

Sincerely, Shelley C. McCabe
 Print Name Shelley C. McCabe
 Address 70 Jobs Lane
 City Osterville State MA Zip 02653
 RECEIVED
 19 2004
 REGULAR MAIL DIVISION
 Date 11/15/04

020

11-15-05

with letter
 and through appeal
 to the cancellation of
 the wind farm
 wind power

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

222

Sincerely, Amy Lowell
Print Name Amy Lowell
Address 33 Cameron Rd.
City N. Falmouth State MA Zip 02556
RECEIVED
NOV 19 2004
LABORATORY DIVISION
Date 11/15/04

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

223

Sincerely, Samuel F. Winsper
Print Name Samuel F. Winsper
Address 2112 Route 28
City HARVICH State MA Zip 02645
RECEIVED
NOV 19 2004
LABORATORY DIVISION
Date 11/15/04

Dear Army Corps of Engineers:

224

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely, Suzanne M. Winsper
Print Name Suzanne M. Winsper
Address 2112 Route 28
City Waltham State MA Zip 02645
RECEIVED NOV 19 2004 REGULATORY DIVISION
Date 11/15/04

Dear Army Corps of Engineers:

225

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely, LoRAINE F. NOLAN
Print Name LoRAINE F. NOLAN
Address 108 Taylor Road
City W. Chatham State MA Zip 02659
RECEIVED NOV 19 2004 REGULATORY DIVISION
Date 11/17/04

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely,

Michael J. Smith

Print Name

Nicholas Lowell

Address

33 Curran Rd.

City

N. Falmouth

State

MA

Zip

02856

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date

11/15/04

226

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely,

Susan Green

Print Name

Susan Green

Address

2 Farmer Street

City

Nantucket

State

Mass

Zip

02554

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date

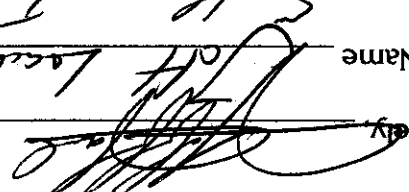
Nov 16, 04

227

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

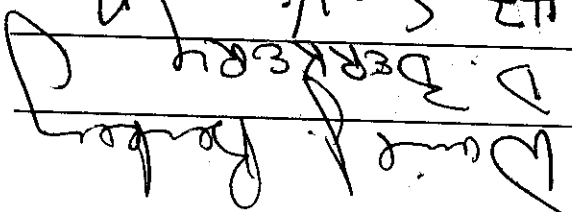
229

Sincerely,

Jeff Leach
Print Name
5 Harris Farm Rd
Address
W. Walling
City
MA
State
Zip
RECEIVED
NOV 19 2004
LABORATORY DIVISION
Date 11/17/04

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

OT lead! This one 4,000 page!

Sincerely,

Daniel J. Berkery
Print Name
47 Seaview Ave
Address
Stonerville
City
MA
State
Zip
RECEIVED
NOV 19 2004
LABORATORY DIVISION
Date 11/16/04
228

Dear Army Corps of Engineers:

230

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely,

Suzanne Wright

Print Name

Suzanne, Rob Wright
734 Saco Mill Rd

Address

City Falmouth, ME

State ME

Zip 04101

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date

11/15/04

Dear Army Corps of Engineers:

231

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely,

Arthur Kelly

Print Name

ARTHUR KELLY

Address 21 SHATTUCK LANE

City CHATHAM

State MA

Zip 01633

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date

11/16/04

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

232

Sincerely,

Print Name Charles Sheppard

Address One Woodstock Rd.

City Leominster State MA Zip _____

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date 11/19/04

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

233

Sincerely,

Print Name Linda B. Devonshire

Address Ms. Linda B. Devonshire
PO Box 1153
West Chatham MA 02669

City _____ Zip _____

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date 11/17/2004

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely, Mary Louise Montgomery

Print Name Mary Louise Montgomery

Address 19 Gunning Point Road

City Falmouth State MA

Zip 02540

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date 11/16/04

234

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely, Dale C. Edmunds

Print Name Dale C. Edmunds

Address 332 Walnut Street

City Weymouth State MA

Zip 02481

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date 11/17/04

235

Dear Army Corps of Engineers:

A 60-day review period is unreasonable to adequately review the massive 4,000-page Cape Wind Draft Environmental Impact Statement document. I respectfully request that you extend the review period to 180 days in order for the public to be as best informed as possible and provide you with thoughtful and unhurried input on this precedent-setting project.

Sincerely,

Richard A. Reilly

Print Name

Address



Mrs. Richard A. Reilly
PO Box 587
Cohasset, MA 02635

State

Zip

RECEIVED

NOV 19 2004

REGULATORY DIVISION

Date 11/16/04

236

Adams, Karen K NAE

From: Piotr Rojek [projek@optonline.net]
Sent: Sunday, November 21, 2004 4:43 PM
To: Energy, Wind
Subject: Support clean energy.

Dear Sir/Madam at the Army Corps of Engineers DEIS,

The proposed wind farm in Nantucket Sound has an opportunity to play a major role in reducing this region's dependence on using fossil fuels and nuclear energy to generate electricity — a noble cause if there ever was one. If the only price we have to pay is the sight of windmills that some find unsightly, it's well worth it. I live on Long Island, New York and I feel that we ought to go forward with the offshore wind farms anywhere e.g. as they are proposed to be build off Jones Beach shores. My point is that to someone who is dying of asthma, bronchitis or other pollution caused illnesses the view do not matter. What it counts is the clear air, how can we make it available: one simple answer environmentally friendly recourses. You can't admire the view striped to the oxygen tank. Our children future depends on our actions now. Twenty years from now people will ask how can we let our nature to be so dismayed; we have had the technology to generate electricity from wind and we did not exploit it? I appeal to the conscience of everyone who will make the decision so our children have a place to live. Sincerely, Piotr Rojek
344 Jericho Tpke.
Floral Park
New York 11001

Adams, Karen K NAE

From: GARY [zelda43@comcast.net]
Sent: Saturday, November 20, 2004 11:19 AM
To: Energy, Wind
Subject: comment

i am for the wind power project.
in fact, the sooner the better.

gary a doss
3 zazu lane
po box 772
north truro ma 02562-0772
508 509 8619

239

Adams, Karen K NAE

From: MJQuickel@aol.com
Sent: Tuesday, November 23, 2004 10:35 AM
To: Energy, Wind
Cc: w-kurker@hyannismarina.com
Subject: Cape Wind Energy Project

To: Karen Kirk Adams, Project Manager, Regulatory Division
From: Kenneth E. Quickel, M.D., Centerville, MA
Re: Cape Wind Associates Proposal
Date: Nov. 23, 2004

I am writing to register my opposition to the Cape Wind Associates' proposal to erect and operate a wind farm on Horseshoe Shoal in Nantucket Sound, and to support placing this good project in a less commercially sensitive site.

The principal industry on Cape Cod is tourism. People come from everywhere to visit our scenic and tranquil towns, to boat on our lovely waters and to play on our clean beaches. To place 130 wind turbine generators, each 420 feet high, in one of the treasures of the Cape, visible to everybody who visits several of our most popular beaches, is almost unbelievable. These will not be quaint, scenic windmills, such as the numerous grist mills scattered across the Cape. This will be an industrial site, and it should be located where it will not detract from our most important assets.

I am sensitive to the "not-in-my-back-yard" syndrome, but this project would be in the Cape's beautiful and economically-valuable front yard. Let's find a back yard to put it in.

Sincerely,

Kenneth E. Quickel, M.D.

11/23/2004

240

Adams, Karen K NAE

From: pkc7@cyberdude.com
Sent: Tuesday, November 23, 2004 1:55 AM
To: Energy, Wind
Subject: wind farm off cape cod

Army Corps

I just wanted to give you my thoughts on the Wind Farm off the Cape Cod coast. Sure wind energy is a great idea the more the better. But putting this Wind Farm off the coast of Cape Cod I think is a big mistake. That area out there is a one of a kind spot for boating and fishing. I have been fishing off the coast of Dennis and Yarmouth for 35 years. The blue fish are there every year.!!!

So Please dont build this wind farm out there off the coast of the Cape.
Why dont you build it at the old Otis Air Base ?

Philip Cunningham
So Dennis,MA

--

Sign-up for Ads Free at Mail.com
<http://promo.mail.com/adsfreejump.htm>

Adams, Karen K NAE

From: Christopher Ellis [longpond@cape.com]
Sent: Tuesday, November 16, 2004 8:58 PM
To: Energy, Wind
Subject: Cape Cod Wind Farm

To whom it may concern:

I strongly support the wind farm in Nantucket Sound. I have been a vocal supporter for years. There is no unselfish reason that anyone could oppose clean, free energy. It is the future. Please support it.

Please make my vote for the wind farm.

Christopher Ellis
Box 146
Brewster, MA 02631

242

Adams, Karen K NAE

From: E. Krause [pearl@capecod.net]
Sent: Tuesday, November 16, 2004 9:01 PM
To: Energy, Wind
Subject: Horseshoe Shoals Wind Farm

Karen,

I have been a fan of this project right from the beginning. So has my wife.

We have traveled to Germany and were awe-struck by the majesty of these giant wind turbines. We drove off the autobahn into strange territory, and a farmers field where these gigantic windmills stood, high above the farmer who was taking in his crops. I photographed my wife, sister and her daughters standing next to these very beneficial structures. They were not the least bit noisy, intimidating, or ugly. They enhanced the countryside, rather than distract from it. To my eyes they were awesome and wonderful. Everyone in our group marveled at their majestic stature.

To the Germans, these structures are now second-naturethey don't even notice them. I can not imagine a more beneficial industry to build here on Cape Cod. Those with a MINBY concern will get "over it" in not more than a moment of time. They will quickly become grateful, as well. I'd bank on it! There just isn't ANY rationale NOT to go forward with this project, FULL SPEED.

Earl W. Krause
15 Tern Lane
Eastham, MA. 02642
pearl@capecod.net

11/23/2004

243

Adams, Karen K NAE

From: Andrew Heafitz [heafitz@mit.edu]
Sent: Tuesday, November 16, 2004 3:54 PM
To: Energy, Wind
Subject: comment supporting the wind farm

I hope that Massachusetts will lead the way for sustainable clean energy with the Cape Wind Wind Farm. Having clean energy alternatives to imported Middle Eastern oil will put us in a better position to deal with terrorists, bolster our foreign policy objectives and make us more secure. It will help reduce air pollution and lower health costs, reduce global warming and help avoid pollution from oil spills. The Army Corp of Engineers has just found that the down sides to the wind farm are negligible in comparison. What are we waiting for? I want the wind farm to be built as soon as possible. I will personally go and visit the site, because I will want to see it. I will happily be one more tourist supporting the Cape Cod economy.

Andrew Heafitz
18 Hadley St.
Cambridge, MA 02140

Adams, Karen K NAE

From: Russ C [rvc3rd@hotmail.com]
Sent: Tuesday, November 16, 2004 9:45 PM
To: Energy, Wind
Subject: Cape Wind

As I will not be able to attend any of the hearings scheduled for the wind farm I would like to take the opportunity via email to express my utmost disdain for the Cape Wind Project and any support given to it. I take this position as a supporter of natural resources, the environment, wildlife and the protection of open spaces. It is my opinion and strong conviction that environmental damage posed by this project far outweighs any minute benefit from decreased power plant emissions or dependence on foreign oil. I support the arguments that you have, I'm sure, heard about increased distress to sea life and death of birds. Additionally I believe this project will deface a beautiful and pristine piece of nature. I would no sooner like to see a power plant built in the unspoiled Rocky Mountains than I would like to see a wind power plant built in the Sound. I will lend all my support to government representatives who oppose the Wind Project and any agencies supporting them.

My best regards,
S. Mindy Haber
52 Union Park
Boston, MA 02118

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<http://toolbar.msn.click-url.com/go/onm00200415ave/direct/01/>

Adams, Karen K NAE

From: bobger3727@juno.com
Sent: Tuesday, November 16, 2004 9:54 PM
To: Energy, Wind
Subject: Cape Wind

From: Robert J. Willis, JR.
11 Herrick Drive
Ipswich, MA 01938-1008
978-356-0315
Registered Professional Engineer: Mass 8064, New Hampshire
3727

In forty to fifty years the planet will exhaust its petroleum resources and for the sake of mankind worldwide we had better begin putting into place alternative energy sources. Wind energy is not an advance in the state of the art, there are thousands of units in operation worldwide. Unfortunately, the technology has not had much media coverage in this country and therefore is an unknown to our public.

I see no need to analyze the suitability of this technology in committee forever, rather there are units in the field that can be utilized for evaluation purposes rather rapidly.

Adams, Karen K NAE

From: Hagopian, Tim [thagopian@worchester.edu]
Sent: Wednesday, November 17, 2004 3:34 PM
To: Energy, Wind

I fully support the production of a wind farm ANYWHERE possible. Besides the obvious benefits (especially in these times), I find them quite attractive.

Tim Hagopian
Math Dept.
Worcester State College
486 Chandler St.
Worc MA 01602

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Adams, Karen K NAE

From: Martydanon69@aol.com
Sent: Wednesday, November 17, 2004 4:44 PM
To: Energy, Wind
Subject: (no subject)

the best thing i have heard of is this cape wind project,please do what you can to make this a reality.

thank you
marty danon

11/23/2004

Adams, Karen K NAE

From: Mohammed Alam [mohammedalam@alyra.net]
Sent: Wednesday, November 17, 2004 4:02 PM
To: Energy, Wind
Subject: Cape Wind

I am writing in support of the Cape Wind project. I believe projects such as Cape Wind are essential for many reason, especially to reduce our foreign energy dependence. Renewable power reduces our dependence on foreign hydrocarbons. If we continue the current trend of using more and more gas-fired power generation, soon we will end up with the same kind of "foreign dependence" for natural gas as we currently have for oil. As you know, we as a nation are facing a natural gas shortage and we are a net importer of natural gas. Almost all our current imports come from Canada, where natural gas resources are declining. If our need for natural gas continues to grow (due to the recent dramatic growth of natural gas fired power generation), the additional natural gas would need to be imported as LNG. Billions of dollars of investments are required for such undertakings, which are extensively capital intensive. Most importantly, there are two very important national security issues related to LNG: (1) almost all the LNG will be imported from politically sensitive countries like Algeria (currently our No 1 LNG supplier), Venezuela, Trinidad and Indonesia. (2) LNG terminals, which include the handling and storage of a highly pressurized flammable gas, poses severe security risk to population. For example, all flights in and out of the Boston Logan Airport are stopped each time an LNG carrier passes through the Boston Harbor.

I appreciate your attention to this matter.

Sincerely,

Mohammed Alam
107 Blackman Road
Ridgefield, CT 06877

Adams, Karen K NAE

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From: Sandy [sferris3696@comcast.net]

Sent: Wednesday, November 17, 2004 7:11 PM

To: Energy, Wind

i support this clean energy source

John Ferris
117 saddleworth way
middleboro
02346

11/23/2004

Adams, Karen K NAE

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From: Sybille Andersen [andersen@nantucket.net]

Sent: Wednesday, November 17, 2004 7:10 PM

To: Energy, Wind

To whom it may concern,

I am a resident of Nantucket island and I strongly support the idea of a wind farm on Horseshoe Shoals. I believe that the Cape and Islands should take this step and be an example to the rest of the country. We must curb our use of the already existing and polluting energy plants, as well as curb our dependence on foreign oil. I would much rather see the turbines spinning in the wind at the horizon than have another oil spill in our area! I am sure that in the long run, the wind turbines will be something that those of us on the Cape and Islands will be proud of.

Thank you for your consideration.

Sincerely,

Sybille Andersen

29 Skyline Drive

Nantucket, MA 02554

11/23/2004

Adams, Karen K NAE

From: William Fitch [fcfcfc@gmpexpress.net]
Sent: Thursday, November 18, 2004 10:21 AM
To: Energy, Wind
Subject: Wind?

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Gentlemen:

Considering ALL THE COSTS associated with imported oil, any renewable energy source is preferable during the energy transformation phase of our planet, and should be developed!!

.....Bill
www.fitchconsultinginfo.com

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Adams, Karen K NAE

From: Molloy, Jack [molloyj@nps.k12.ma.us]
Sent: Thursday, November 18, 2004 4:55 PM
To: Energy, Wind
Subject: DEIS Feedback

After reading extensively about the DEIS on the proposed wind farm on Nantucket Sound, I strongly support it.

Thanks,

Jack Molloy
35 Somerset Lane
Nantucket, MA 02554

11/23/2004

Adams, Karen K NAE

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From: Boettger, Peter C [BOETTGERP@mail.ecu.edu]
Sent: Tuesday, November 16, 2004 3:31 PM
To: Energy, Wind
Subject: cape wind project

I am writing in full support for the proposed off shore wind energy project in Nantucket sound. It makes great sense from an energy, economic, and environmental standpoint. It is a win-win project for everyone.

Peter Boettger
2008 Fairview Way
Greenville, NC 27858

11/22/2004

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Adams, Karen K NAE

From: wedge [wedgeb@adelphia.net]
Sent: Tuesday, November 16, 2004 3:54 PM
To: Energy, Wind
Subject: cape wind

Dear Sirs, PLEASE we need to start doing something here in America to stop the use of oil and nuclear. Let Cape Wind do it's thing. It is good for our country. Thanks, Richard Bramhall Jr Ply Ma

Adams, Karen K NAE

From: Noreen Thompsen [covebluffs@capecod.net]

Sent: Tuesday, November 16, 2004 3:54 PM

To: Energy, Wind

Subject: Public comment on the wind farm

I wish to voice my support for the proposed wind farm in Nantucket sound.

I have seen the wind farms in Northern, Germany, Denmark, Sweden and Norway and find them far more appealing and environmentally friendly than the Pilgrim nuclear power plant and the Mirant plant. I do not find the windmills to be a blight unlike the alternative energy sources.

As a motel owner and operator, I do not feel that the wind farm will have any negative impact on tourism and in fact could very well positively impact tourism at least initially. In general, people who are concerned about the environment make great guests.

I lived in Karlsruhe, Germany during the Chernobyl Nuclear accident in the late 80's and know first hand the negative effects of a regional nuclear accident. For nearly a year we had limited fresh fruits and vegetables due to the fear of contamination and always questioned the origins of the produce that we consumed. Produce was in short supply, much more expensive and not very fresh. Realistically we who inhabit Cape Cod year round have little hope of evacuation in the event of a nuclear accident at Pilgrim.

We endure pollution from the Midwest as well as from Mirant. We have one of the highest rates of breast cancer in in region and I believe that any reduction in pollution is a good thing for the peninsula.

To contact me please telephone, 508-240-6178.

Noreen Thompsen
15 Seaview Road
Eastham, MA
02642

256

Adams, Karen K NAE

From: Paul Wood [pfwatty@rcn.com]
Sent: Tuesday, November 16, 2004 4:03 PM
To: Energy, Wind
Subject: IN FAVOR OF THE CAPE WIND PROJECT

TO WHOM IT MAY CONCERN:

I am writing to voice my support for the Cape Wind Project. My review of the draft report convinces me that there will be no long-term environmental damage resulting from the project, only long-term environmental benefits. While I live in Boston, I have grown up spending summers along the water in Rhode Island and Cape Cod. The project will NOT be a blight on the landscape, but a benefit. It will be beautiful, attracting tourists and (along with the many jobs created by the project itself) stimulate more economic benefits to the region. With friends' relatives presently stationed in Iraq, I understand, more than ever, the need for energy independence.

Again, I speak strongly in favor of the Cape Wind Project.

Paul Wood
24 Rutland Square
Boston, MA 02118

11/22/2004

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Adams, Karen K NAE

From: Nichols, Jonathan N [jnnichol@middlebury.edu]

Sent: Tuesday, November 16, 2004 4:06 PM

To: Energy, Wind

Subject: Cape Wind

I would like to voice my opinion that I am in full support of the Cape Wind project on Horseshoe Shoal. This project has huge environmental benefits to the country and New England, and it would be a huge mistake not to build the proposed windmill project.

Sincerely,

Jonathan N. Nichols

Milliken 621
Box 3716 Middlebury College
Middlebury, VT 05753
802.443.4366

781.424.7904

Adams, Karen K NAE

From: roger ernst [rogernmiernst@hotmail.com]
Sent: Tuesday, November 16, 2004 4:06 PM
To: Energy, Wind
Subject: Windfarm in Nantucket Sound

Dear Sirs;

I write this as person who has lived part of the time on Nantucket ever since 1926. Also all over the world in the Army and as a Foreign Service Officer.

The Cape Wind Project needs to move ahead. The electricity is needed and the "experimental nature of the project even increases its desirability -for the nation as a whole. As for navigation: I am a sailor and will look forward to seeing/using the towers to help me!. Fisheries: All over the globe, marine species find towers, etc desirable for their purposes -play, mate, etc.

As for aesthetics, look at what is said in the Nordic nations about their own towers: How lovely, how they improve a dull shyscape!

For conditions: I would addonly that in the event of a "failure" of a tower, that it be removed by the company that installed it at their own expense.

I hope these thoughts are of help. Sincerely,

Roger Ernst

Roger Ernst: October-May at 9176 Highland Ridge Way, Tampa Fl. 33647-2277.

TEL: 813/973-7353. June-September at 62 Monomoy Road, Nantucket, MA 02554.

TEL: 508/228-1706.

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Adams, Karen K NAE

From: Jonathan Bonanno [jonb@intercom.com]
Sent: Tuesday, November 16, 2004 5:11 PM
To: Energy, Wind
Subject: Promote the Cape Wind Project, PLEASE!

Dear USACE-

As a home owner on Martha's Vineyard, I totally support the Cape Wind project and after reading the draft of the Impact Study, it seems that you agree. This is wonderful news for safe and clean energy production and puts America on a path to energy independence.

Cape Wind is an important step toward greater energy independence, lower energy costs, new jobs and a healthier environment. The Draft Environmental Impact Statement shows that Cape Wind will produce compelling public interest benefits. The report is the product of three years of scientific, environmental and economic analysis and includes the input of 17 federal and state cooperating agencies.

Jonathan Bonanno
66 Edgartown Bay Road
Edgartown, MA 02539

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11/22/2004

Adams, Karen K NAE

From: David R. Marcus [dmarcus@chestnutcapital.com]
Sent: Tuesday, November 16, 2004 4:21 PM
To: Energy, Wind
Subject: Cape Wind

Congratulations on not caving in to the substantial political pressure you have been facing. The Cape Wind site is nearly technically perfect and deserves to be built. I am a wind energy investor with no connection to the project, and when people ask me to handicap whether Cape WIND WILL GET BUILT, MY ANSWER IS THAT IF THE REGULATORY PROCESS IS ALLOWED TO PROCEED, IT WILL GET built. You have done an outstanding job with the draft EIS. The developer has been through over M\$15 in pain in development soft costs, by far a record for this sort of project, and has played by the rules. Please allow them to proceed.

David Marcus, President
Chestnut Capital LLC
294 Chestnut Street
West Newton, MA 02465

TEL: 617-512-7800
FAX: 617-527-5608

dmarcus@chestnutcapital.com
www.chestnutcapital.com

Adams, Karen K NAE

From: Delphigrup@aol.com

Sent: Thursday, November 18, 2004 2:13 PM

To: Energy, Wind

Subject: Comments on Cape Wind Energy Project file no. NAE-2004-338-1

~~25~~
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Dear Ms. Adams,

Thank you for sending the public notice pamphlet on the Cape Wind Energy Project.

I think that, as long as any harm to migratory birds is minimized, the project should be allowed to go forward. The windmills will actually look good, like a sailboat race, and the clean power will be a great alternative to another fossil fuel power plant.

Plus, the Cape is not exactly wilderness.

Steve Gaskin
50 Old Orchard Rd.
Sherborn, MA 01770

11/23/2004

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Adams, Karen K NAE

From: Robert Cook [robert@rcooks.com]
Sent: Tuesday, November 16, 2004 4:27 PM
To: Energy, Wind
Subject: I support capewind

I see this project as important, not only to Cape Cod, where we have a summer home, but as a model to the entire country. I think it would be tragic to stop this project. Our country needs to produce its own energy.

Robert Cook
POBox 395
Carthage, IL 62321

11/22/2004

Adams, Karen K NAE

From: Ken Olum [kdo@cosmos.phy.tufts.edu]
Sent: Tuesday, November 16, 2004 5:21 PM
To: Energy, Wind
Cc: kdo@cosmos.phy.tufts.edu
Subject: comments on Cape Wind DEIS

I would like to make the following comments on the Cape Wind draft environmental impact statement:

Generally I am in agreement with the conclusions of the DEIS. Of particular note is the improvement to air quality and public health as a result of displacing powerplant emissions.

I disagree with the conclusion that the proposed facility would have an adverse visual effect on coastal properties. In my opinion the single wind generator on Windmill Point in Hull has a positive visual impact on the view over Hull Bay, just as boats under sail do. I would expect a similar positive visual impact on the view over Nantucket Sound.

Sincerely,

Ken Olum
156 Massapoag Ave.
Sharon, MA 02067

Adams, Karen K NAE

From: David_Simkins@munters.com
Sent: Tuesday, November 16, 2004 4:28 PM
To: Energy, Wind
Subject: Ref File#NAE-2004-338-1

The use of public space and the countries natural resources should be considered carefully. The U.S. Army Corps of Engineers has made an unbiased analysis of the impact the Cape wind project will have on Nantucket Sound. Cape Wind Associates has picked an ideal location to site the turbines and is making an investment in a very valuable renewable energy source.

The shallow water off-shore site provides reasonable access to the grid while having the least impact on the navigable waters of Nantucket sound and the view shed from surrounding land masses. More than half of the available power generation in New England comes from natural gas fired power generating facilities which are efficient and burn clean fuel. The bigger benefit however is that because of the nature of the power generation in the region the use of renewable energy sources like wind, solar and others has little impact on base load coal, hydro or atomic facilities.

More of our power needs in New England need to come from renewable energy sources.

David Simkins

8 Jackson Street
Newburyport, MA 01950
978-204-1001 Phone

cc. Gov. Mitt Romney
Sen. Edward Kennedy

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Adams, Karen K NAE

From: Jean Mangiafico [jmangiafico@comcast.net]

Sent: Tuesday, November 16, 2004 4:43 PM

To: Energy, Wind

Subject: Wind Farm

Speaking as an individual, I would like you to know that I support construction of the Wind Farm proposed by Cape Wind in Nantucket Sound. I have studied the issue since it was first proposed and although I know that there are sacrifices that must be made, I feel that it is a vital step.

Thank you for all your hard work.

Jean C. Mangiafico
912 Main St. #307
Chatham, MA 02633

11/22/2004

Adams, Karen K NAE

From: Dave Dilts [timelesstech@comcast.net]
Sent: Tuesday, November 16, 2004 4:47 PM
To: Energy, Wind
Cc: Laura Martin
Subject: Cape Wind Project

U.S. Army Corps of Engineers
N.E. District
Attn: Karen Adams
696 Virginia Road
Concord, MA 01742

Dear Ms. Adams:

I am writing this letter in support of the Cape Wind project. This clean power park proposal has been scrutinized by a great many specialists in the environmental arena who have clearly found it to have a very benign impact on the ecosystems. Furthermore it is clear that as we continue to burn fossil fuels to produce electricity, we are not only destroying a dwindling supply of finite energy, but we are also destroying our environment. If an EIS was placed on a new power plant to be built using fossil fuels in the same region, would the results be as benign? I think not. If fossil fuels were used to produce products, like plastics, that are recyclable, at least we would not run out of this important raw material. When we burn it to create electricity, it is gone forever and much pollution from it is imbedded in our soil and lungs. Another thing I would like to point out is that the many, many new cell phone repeater station towers being constructed just about everywhere in the United States are open truss structures that kill thousands of birds and bats indiscriminately, regardless of whether they are in migration paths. I would like to have a comparison to the number of birds killed by those unsightly structures compared to the elegant turbine towers with blades that will be spinning so slowly, that birds will fly around them. I will be truly disappointed in our due process if blinders continue to be handed out to the uninformed by the uninformed. Please widely distribute the distilled findings in your report so this will not be so.

Sincerely,

David Dilts
Salt Air Village
106 Middle Road
Dennis Port, MA 02639

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Adams, Karen K NAE

From: cliffcenter [cliff@centermarine.com]**Sent:** Tuesday, November 16, 2004 4:52 PM**To:** Energy, Wind

I grew up in Falmouth and have spent a lot of my life on Vineyard Sound sailing and power boating, I have seen numerous wind farms in Europe and have worked on offshore oil platforms. I am quite in favor of the Cape Wind project and feel that one can not "talk green" without supporting alternative energy. It is unfortunate that a few influential people in and around Hyannis can carry so much stroke. People on the Cape are adverse to anything new and anything that represents change. The most vocal are the against progress, I see a silent majority that feel that to resist the wind energy project would be hypocritical to their values and concern for the world we leave our children. At the same time, they fall prey to the exaggerated claims by those against the project. I fully support the project and will to convince others.

Cliff Center
118 Clinton Ave
Falmouth MA, 02540
508-548-2728
cliff@centermarine.com

11/22/2004

Adams, Karen K NAE

From: Jack Kutner [kut4@comcast.net]
Sent: Tuesday, November 16, 2004 5:00 PM
To: Energy, Wind
Subject: Support of Cape Wind

Dear Sirs and Madams:

I am writing to you to express support of the Cape Wind project proposed for the waters off-shore of Cape Cod. Given the positive environmental assessment, here is a chance to embrace the inevitable. Thinking people understand that dramatic steps must be taken to move the U.S. (and world) economy away from its dependency on fossil fuels. Wind power along with other alternative energies must and will be a part of that solution.

The day will come when the large wind turbines are looked at fondly like other manmade landmarks such as lighthouses and windmills. Do not let the vested interests of a few stand in the way of such progress for the greater good.

Sincerely,
Jack P. Kutner
6 Deerfield Rd.
SHerborn, MA 01770

Outgoing mail is certified Virus Free.
Checked by AVG anti-virus system (<http://www.grisoft.com>).
Version: 6.0.788 / Virus Database: 533 - Release Date: 11/1/04

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Adams, Karen K NAE

From: Frank M Savino [fmsavino@juno.com]
Sent: Tuesday, November 16, 2004 5:35 PM
To: Energy, Wind
Subject: Cape Wind Support

We completely support the Cape Wind Project and feel that it is most beneficial to the environment and people of the United States. The time has come to harness as much energy from non-fossil fuels as we can. This is an opportunity we can not let slide by.

Frank M. and Susan M. Savino
P. O. Box 181
East Bridgewater, MA 02333-0181

Juno Platinum \$9.95. Juno SpeedBand \$14.95.
Sign up for Juno Today at <http://www.juno.com>!
Look for special offers at Best Buy stores.

Adams, Karen K NAE

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From: Sunman6@comcast.net
Sent: Tuesday, November 16, 2004 5:40 PM
To: Energy, Wind
Cc: www.capewind.org@comcast.net
Subject: cape wind project

Greetings!

We are Cape Codders who support the wind project whole-heartedly. We are in favor of any renewable energy source that will relieve some of the USA's dependence on foreign oil. We see no problem whatsoever in the visual impact the turbines will have on the views we enjoy from our beach at the end of Baxter Ave in West Yarmouth or from my daughter's beach on Martha's Vineyard. We do, however, have a problem with that monstrosity clearly visible at the Sagamore bridge and hope that you will use your influence to have it dismantled sometime in the future. Perhaps the output of the windfarm will one day make the odious power plant obsolete.

There is nothing unattractive about a windmill or wind turbine. There are hills full of them in California and I have enjoyed driving the roads through these hills. It's such a good feeling to know that nature is providing energy that will not harm our planet. We need to get these wind projects going at a much faster rate hence teaching the next generation how to preserve the planet.

Please do not be influenced by the NIMBY's who will come up with feeble reasons for not going forward with this project. They should be rejoicing in the effort and looking forward to the wonderful example we will show the country with this wonderful wind farm. Surely it will attract more tourists rather than it will discourage from visiting. We can't wait to see it in action!

Thank you for considering our views.

Janice & Rick Schiltz
80 Baxter Ave
West Yarmouth MA 02673
508 790 1206

11/22/2004

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Adams, Karen K NAE

From: g clements [JUSTCL@COMCAST.NET]

Sent: Tuesday, November 16, 2004 5:48 PM

To: Energy, Wind

Subject: WIND MIL

IT HAS TO START SOME WERE. I AM ALL FOR IT.CLEAN AIR IS MORE IMPORTANT THAN
CAPECOD SMOKE STACK .I AM A TAX PAYER OF OAKBLUFFS MASS. CLEM

11/22/2004

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Adams, Karen K NAE

From: jon [jon@c4.net]
Sent: Tuesday, November 16, 2004 6:10 PM
To: Energy, Wind
Subject: Cape wind project

I am all for the cape wind project. As our reliance upon oil seems to be growing, we need to supplement our need/ desire for more electricity with wind, and other renewable energy sources. I am much in favor of an "eye sore" at the beach, then another nuclear plant, in someone else's backyard. Being that I am a realist, I think the power generation plant should be near the demand center, and as an electrician I am just watching the demand here grow.
Jon R. Haarman

11/22/2004

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Adams, Karen K NAE

From: Kathy Hubby [kathy.hubby@verizon.net]

Sent: Tuesday, November 16, 2004 6:28 PM

To: Energy, Wind

Subject: Wind Project in Nantucket Sound

Dear Army Corps of Engineers

My husband and I are strongly supporting this project. We need to get off the dependence of foreign oil and use renewable energy resources. The Cape Wind Project is a way the Cape can be provided power by a renewable source.

Please proceed. Our country needs to use wind power on a larger basis. We have seen wind power use in Sicily and Costa Rica.

Thank you for your attention.

Sincerely, Kathryn and Robert Hubby
160 Highmeadow Rd.
Wellfleet, MA 02667

11/22/2004

274

Adams, Karen K NAE

From: allan.schubert [allan.schubert@comcast.net]
Sent: Tuesday, November 16, 2004 6:39 PM
To: Energy, Wind
Subject: Wind Power in the Bay

I believe our country has a good energy policy.

The policy is broad based and uses an assortment of available and mostly practical sources.

Wind power is more practical in certain locations technically than others.

The bay between Nantucket and Cape Cod is an ideal technical location for Wind Power.

A few selfishly motivated people living on the fringe shorelines abutting The Bay should not be permitted to successfully lobby the demise of a project so important to society at large.

I say to those opposed to this project, "You can't have it both ways". This particular solution to our energy crisis is more important than you're personal view of the ocean"

Allan Schubert
Retired Manufacturer
31 North Street, POB #1
Mattapoisett, Massachusetts 02739

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Adams, Karen K NAE

From: arnold katz [starfe1@hotmail.com]
Sent: Tuesday, November 16, 2004 7:10 PM
To: Energy, Wind
Subject: I support Cape Wind

I want to go on record as a supporter of Cape Wind. We need to start weaning ourselves off oil producing countries and wind power is a great start. The time is now to move to alternative energy and I hope this will be a start

thanks

Arnold Katz

Adams, Karen K NAE

276

From: Tipanna@aol.com
Sent: Tuesday, November 16, 2004 8:05 PM
To: Energy, Wind
Subject: I'm in favor of the Wind Farm ...

We must get smart now, not live in the Dark Ages, time to let go of oil and gas and use alternative ways of energy...

I hope that there are enough enlightened people who can make this happen.

I'd rather see windmills than a power plant spewing out pollution any day!

Deanna Demers

Mattapoisett, Ma...

Movie, What tHe BLeeP Do WE (K) now!?

'You shall no longer take things at second or third hand, nor look through the eyes of the dead, nor feed on the specters of books. You shall not look through my eyes either, not take things from me.

You shall listen to all sides and filter them through yourself...

~ Walt Whitman

'Man did not weave the web of life, he is merely a strand in it.

Whatever he does to the web, he does to himself.

~ Chief Seattle

"The great Albert Einstein said;

I have yet to meet a single person from our American culture, no

matter what his/her education, I q, and training, who had

powerful transpersonal experiences

and continues to subscribe to the

Materialistic Monism (one who believes only one reality), of Western Science.

A hundred times a day, I remind myself that my inner and outer

life depends upon the labor of others, living and dead, and that I

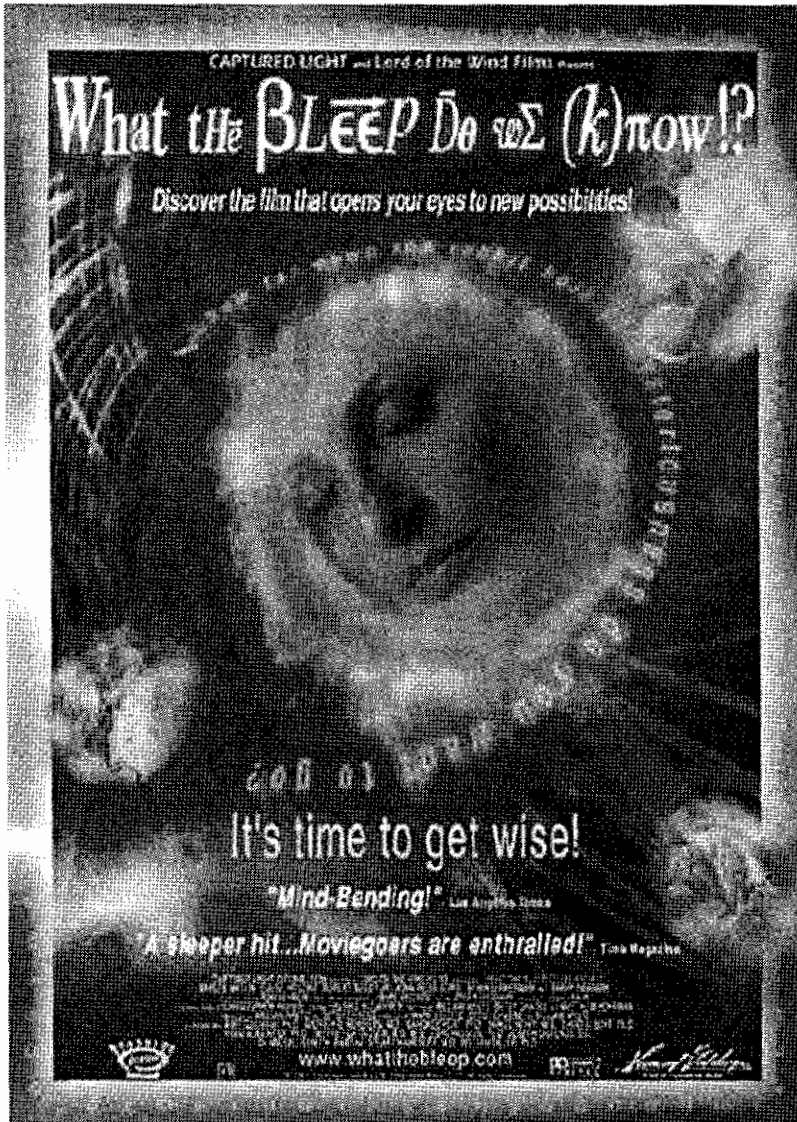
must exert myself in order to give back in measure as I have

received and am still receiving."

Each of us inhabits a separate physical body. A hundred years of

parapsychology research indicates that there is no separation in

consciousness. ~ Russell Targ



Happy married women have healthier hearts. They have someone to depend on & share life with. Marry well, 90% of your happiness depends on it...



Do not meddle with the
Affairs of Dragons, for you
are good and crunchy with
Ketchup!

Ban Hunting! Ban Nuclear! Be Kind!

The tree that bends in the wind, lasts; the one
that is rigid, falls. People are like that...

Crispin's new poetry book! Info at poetictimes.com

<http://journals.aol.com/tipanna/LivinginthePresentMoment>

www.yoyoga.com www.poetictimes.com www.peta.org

www.redjellyfish.com

<http://www.ezskins.com/author.phtml?>

[13013+ScreenSavers](#)



Nizhoni-Tipsoo

(beautiful furry)

<http://www.picsfolio.com/tipanna> my blog, photos and stuff

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Adams, Karen K NAE

From: milton schwartz [annmick@adelphia.net]
Sent: Tuesday, November 16, 2004 8:19 PM
To: Energy, Wind
Subject: DEIS

US Army
Corps of Engineers

I am a Cape Cod resident, writing for a number of Cape residents who are vitally interested in approval of the Cape Wind project. We, of a mind, are determined that active steps be taken for reduction in use of fossil fuels, and their future elimination as an energy source. There are irrefutable indications that permanent environmental and climatic damage is occurring to our natural environment, which may be irreversible. The Cape Wind project, though modest in its fossil energy displacement, is a significant step forward, which may prove to be a milestone toward the national goal of fossil fuel replacement.

It is important that this pilot project be considered for approval by the Corps.

Milton Schwartz
2A Georges Rock Road
Sandwich, MA 02563
Former Major C.E.

Adams, Karen K NAE

From: alice [al.geo@rcn.com]
Sent: Sunday, November 21, 2004 8:42 AM
To: Adams, Karen K
Subject: Fw: Against location of Wind farm

279

Subject: Against location of Wind farm

Dear Ms. Adams, I love the idea of wind energy and agree with you totally about the right locations. That's all I'm asking. Cape Winds was suppose to look and research alternative locations for the wind farms. Cape Cod Community College was also. However shortly after they (CCCC) was going to do their own report, Cape Winds donated \$100,000 to them. Who else has had the monies to research alternatives sites? Where is the Data coming from for the report.

I hope and pray that the government would subsidize other alternatives. More for Solar my self. At least you can store Solar and you can't with wind. I live on the ocean where the wind mills will be located and there are so many days especially in the summer where there is no wind. Many days. If the wind isn't blowing there is no power. So they still need fossil fuel plants. In Hawaii all new construction they are giving subsidies to install solar automatically. Which I think is heading in the right direction. Plus now they are coming out with Hybrid Cars which I think is another wonderful invention and the government should help car manufactures to develop these kind of cars. Plus government and public buildings or parking lots with solar lighting would be worth looking into and developing than exploring a new territory here. Ever since Denmark has had to repair their wind mills which have only been up for two years, we haven't heard a word from Cape Winds about their success any more. Why is that? People are not aware of how much fossil fuel these turbines use and the storage of such. Just doesn't make sense to me.

There are so many areas to help with fossil fuels but I fear that Cape Winds has found a loop hole in the laws that will jeopardize our water and wildlife. And just a few individuals will reap the benefits but many will suffer the consequences. I still don't understand why they (the wind mills) can't be placed in the ugly power lines that have already been designated for utilities. The power lines are already set up to take the power source to the Substations and to the Grid. Why waste more land for the same purpose? I just don't understand the logic. Wind is Wind and Cape Cod is only a few miles wide from North to South.

If there is any way or information that you can find to stop the location of the wind mills I will appreciate it. I'm just a resident here that donates my time and money to HSUS to help orphan and hurt wild life and also interested in keeping Cape Cod a place where people can get away from the hustle and bustle of the cities. With flashing lights and fog horns I think it might lose the peacefulness of it all...

I also witness flocks of geese, ducks, swans etc over Nantucket Sound. I live here and have a spy glass but I don't have a degree of any kind to stop a big business from destroying a beautiful and meaningful sight. The only thing that makes our plant different than others is our water....What will happen if we mess with that?

Unfortunately I will not be able to attend the meetings coming up here on the Cape but I do want my voice and concerns to be heard...

Thank you for your time and efforts in this important issue. We do appreciate your hard work whether it goes through or not. I know you have spent years on this project and hope that whatever the decision is it will work out for the best all around.

11/22/2004

Sincerely,

Alice Fardy

Ocean View Motel

966 Craigville Beach Rd

Centerville, MA 02632

508-775-1962 (inside area code)

800-981-2313 (outside area code)

Adams, Karen K NAE

From: rcbartlett@webtv.net
Sent: Sunday, November 21, 2004 2:42 PM
To: Adams, Karen K
Subject: DEIS

280

Dear Karen Adams, Thanks for the summary DEIS. It is excellent. Please resist the calls for extra commentary time---it's just a cover to give the Alliance more time for Warner/Kennedy type sneaky tricks. The majority of Cape Codders now want to see this show on the road. Sincerely, Richard C Bartlett, P.O.Box 163, Cotuit, MA 02635

OFFICE OF THE SELECTMEN

PHONE (508) 430-7513
FAX (508) 432-5039

732 MAIN STREET, HARWICH, MA 02645



November 12, 2004

Colonel Thomas L. Koning, District Engineer
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

281

Re: Proposed Cape Wind Project, Nantucket Sound

Dear Colonel Koning:

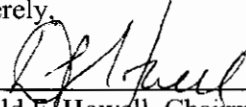
It has come to the attention of the Town of Harwich that as part of the submission for the proposed wind generators in Nantucket Sound as offered by Cape Wind, the applicant has not provided an Oil Spill Fatality map and/or an Oil Spill Trajectory map as part of the Draft Environmental Impact Statement.

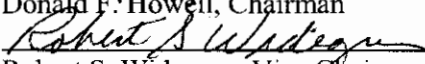
Following a review by our Health Director, Conservation Agent and Natural Resources Director, the Town of Harwich would like to strongly encourage you to request that this document be included as an integral part of your comprehensive environmental permitting review.

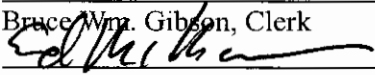
Our Harbormaster has noted that toxic dielectric transformer cooling oil is non-biodegradable and has suggested that if 40,000 gallons were to be accidentally released into Nantucket Sound from an offshore transformer platform, such an ecological disaster would cause very serious problems for Harwich and the entire Cape. If this oil exhibits those properties expected, it could float on the surface and drift with the tide and wind. Since the predominant winds for the Cape are southwest, the expectation is that a significant portion of this oil, if released into the Sound, would find its way to Harwich's shores and harbors thereby contaminating the shellfish beds and potentially killing large numbers of fauna and flora.

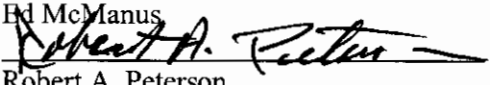
We are confident that you will agree with our position and we appreciate your consideration. If you have any questions regarding this request, please do not hesitate to contact our office at the number above.

Sincerely,


Donald F. Howell, Chairman


Robert S. Widegren, Vice Chairman


Bruce Wm. Gibson, Clerk


Robert A. Peterson

HARWICH BOARD OF SELECTMEN

/rjr

cc: Walter Cruikshank, Department of Interior
Ellen Roy Herzfelder, MEPA
Tim Timmermann, EPA
Tom Leach, Paula Champagne, John Chatham

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NOV 18 2004

REGULATORY DIV.

287

Christine Godfrey
Chief, Regulatory Division
ARMY CORPS OF ENGINEERS
N.E. District
696 Virginia Road
Concord, MA 01742

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NOV 17 2004

CONCORD DISTRICT

November 2004

Dear Ms. Godfrey,

Please immediately extend the public comment period on the Draft Environmental Impact Statement for the proposed Cape Wind project to 180 days. Any shorter time period is entirely insufficient to allow the public ample opportunity to provide input on such a lengthy and important document on a complex and controversial project.

Thank you for your prompt attention to this matter.

Sincerely,

Capt. Norman F. Hall C.M.S.

9 BLUENOSE LANE

OSTERVILLE, MA. 02655

- P.S. 1. I enclose also a letter recently written to the U.S.C.G.*
- 2. This project would be closer to land than indicated*

Capt. Norman F. Wahl
9 Bluenose Lane Osterville, MA 02655
Phone 508-420-9455 Fax 508-420-7172

United States Coast Guard
408 Atlantic Avenue
Room 628
Boston, MA 02110

November 3, 2004

Attn: Mr. Kevin Blount

Re: Proposed Wind Farm - Nantucket Sound
Horse Shoe Shoal Site

Dear Kevin;

I continue to have great concern as respects the proposed project and frankly believe it should not go forward.

1. The shoals are navigable to many vessels other than deep draft vessels. Much of the water depth is greater than, for an example, areas of the West Passage of Narragansett Bay. Winter weather with greater wind velocities create conditions whereby the island vessels have to tack rather than straight line navigation. The extreme number of towers and their size would, in my opinion, create a hazard.

2. Ice conditions in Nantucket Sound do exist and the winter of 2004 proved this also I have experienced greater ice in past years. Ice as it forms can layer when it has an object to layer against. The towers could be presenting extremes related to ice in Nantucket


Sound. Examples have been given of towers built in ocean waters with cold climates. Nantucket Sound is a shoal sound, as you know too well, and affords greater ice hazards than even Vineyard Sound.

3. I am also concerned with fluctuating electrical power as respects radar. Wind fluctuates and the electrical current generation would fluctuate with it. The cables could give erratic current having its influence on vessel radar. Example: when you pass in close proximity to overhead cables in the Cape cod Canal it produces a target on the radar. The 130 towers themselves would produce too many blips or targets on a radar screen to keep track of when navigating a vessel. These large more prominent targets could in turn cover up small vessel targets or produce radar "ghosts". With the fog prone months in Nantucket Sound this entire system could produce the most extreme accident-prone conditions.

4. I know you are aware of the fact that most of our lighthouses are about 70' to 80' except Gay Head, which are still less than the proposed towers. It appears to me that most of our present lighthouse aids to navigation would be hidden by the towers and whatever lighting they would be required to show.

I am taking the time to write this based on many years of experience and I know I'm writing to a person with substantial knowledge of the area.

Sincerely,


Capt. Norman F. Wahl

Cape Cod Times
11-15-04

Cape Wind can pass public-interest test

Thank you for acknowledging some of the benefits of the Cape Wind farm in your Nov. 9 editorial and pointing out some of the "red herring" arguments currently being used by project opponents. It is our hope that the Draft Environmental Impact Statement provides a better understanding of the project for the public and opinion leaders.

We agree with you that the country desperately needs clean, alternative sources of energy. Because of this pressing need we respectfully disagree with you that we should wait for federal government central planning to identify offshore wind sites. That action could take years or never happen. In fact, central planning was rejected for land-based wind farms on public lands in favor of developers selecting sites and then undergoing an environmental/public interest review.

We recognize for some citizens the prospect of a wind farm on Horseshoe Shoal may be an aesthetic sacrifice. Weighing that sacrifice against Cape Wind's contributions to human health, energy independence, lower energy costs and new jobs is the public-interest test. Increasingly, respected environmental, health, labor and consumer interest groups, as well as local citizens, think Cape Wind will pass that test.

JIM GORDON
President, Cape Wind
Yarmouthport, Boston

Reference to opposing
Public Comment gets
classified as "Red Herring"

The prospect of this prop
could also kill the tow
industry.
Building in the publ
waters and granting
would be similar to
private industry
building on an
Interstate Hi

283

Comment Sheet
On Draft Environmental Impact Statement (EIS)
For the proposal for an Offshore Wind Project
In Nantucket Sound

Name: Pamela Foster

Address: RR 2 BOX 1165 P
Vineyard Haven, MA 02568

Phone Number (Please include area code): 508 693-6033

Email Address: gibsonfos@earthlink.net

Please state your questions/comments in the space below:

I would like to request an
extension on the time limit
for review of the Impact
Statement. It is a very
lengthy document and I
believe more time is needed.

Thank You.

REGULATORY DIVISION

NOV 18 2004

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Please fold this questionnaire in half, affix two stickers or pieces of tape,
and mail it to the address listed on the other side.

Comment Sheet
On Draft Environmental Impact Statement (EIS)
For the proposal for an Offshore Wind Project
In Nantucket Sound

204

Name: Beatrice Phear

Address: 100 Obed Daggett Rd PO Box 1029
West Tisbury, MA 02575

Phone Number (Please include area code): 508-693-3791

Email Address: _____

Please state your questions/comments in the space below:

I am writing in support of having a
wind farm on the Nantucket shoals. As
a Vineyard resident, I recognize that
there is a trade-off with the aesthetics,
but I think the wind farm will be no
worse than the ferries, cruise ships &
other boats that clutter the sound.

We must start using alternatives to oil.

I have no affiliation with the wind-farm
support groups - Housewife age 63

Please fold this questionnaire in half, affix two stickers or pieces of tape,
and mail it to the address listed on the other side.

RECEIVED

JUN 19 2004

LOCALITY DEPT



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge St. Suite 900
Boston, MA 02114

285

Mitt Romney
Governor

Kerry Healey
Lt. Governor

Ellen Roy Herzfelder
Secretary

Tel: (617) 626-1000
Fax: (617) 626-1181

<http://www.state.ma.us/envir>

Facsimile Cover Sheet

To: Col. Tom Koning From: Jim Hunt
Fax: 978-318-8821 Date: 11/17/04
Phone: _____ Pages (including the fax cover sheet): 2
Re: DEIS Comment Extension Request Cc: KAREN ADAMS
☒ Urgent ☐ For Your Review ☐ Please Comment

Comments:

As discussed.
Jim



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2524

MITT ROMNEY
GOVERNOR

KERRY HEALEY
LEUTENANT GOVERNOR

ELLEN ROY HERZFELDER
SECRETARY

Tel. (617) 626-1000
Fax. (617) 626-1181
<http://www.mass.gov/envir>

November 16, 2004

Colonel Thomas Koning
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742

Dear Colonel Koning:

I am writing to respectfully request that the US Army Corps of Engineers extend the public comment for the review of the Cape Wind Draft Environmental Impact Statement (DEIS). I acknowledge that the current 60-day comment period is longer than required under the National Environmental Policy Act (NEPA). However, I am deeply concerned that the current comment period is not sufficient for the public or state, federal and local agencies to reasonably review the DEIS, which is over 4,000 pages in length, and provide meaningful comments to the Army Corps. The inadequacy of the comment period is exacerbated by the fact that the current review period occurs during a time of national holidays and various religious observances.

As you know, the Executive Office of Environmental Affairs is reviewing the document as a Draft Environmental Impact Report in accordance with Massachusetts Environmental Policy Act (MEPA). The Cape Cod Commission is also reviewing the document in accordance with its enabling statute. If the Army Corps is able to extend the comment period on the federal level, we will work with the project proponent to extend the comment period on the state level as well to ensure continued coordination of the federal, state and local review process.

I appreciate your consideration of this request and I look forward to hearing back from you at your earliest convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "Ellen Roy Herzfelder".

Ellen Roy Herzfelder

cc: Jim Gordon, Cape Wind



CAPE COD COMMISSION

3225 MAIN STREET
P.O. BOX 226
BARNSTABLE, MA 02630
(508) 362-3828
FAX (508) 362-3108

E-mail: frontdesk@capecodcommission.org

286

November 18, 2004

Ms. Karen Kirk Adams
U.S. Army Corps of Engineers
New England Division
696 Virginia Road
Concord, MA 01742-2751

Re: Cape Wind EIS Comment Period Extension

Dear Ms Adams:

On behalf of the subcommittee responsible for the Cape Cod Commission review of the Draft Environmental Impact Study/Environmental Impact Report (DEIS/EIR) for the Cape Wind Energy Project, I would like to respectfully request that the Army Corps of Engineers consider extending the 60-day comment period for review of this document by a minimum of 45 days.

This request is made due to the comment period coinciding with the holiday period that reduces the amount of time for reading, understanding and preparing comments on the DEIS/EIR. The complexity and length of the DEIS/EIR requires significant time commitments by all reviewing it and any additional time that can be granted for commenting would assist in this task greatly.

An extension would allow us to hold our required public hearing in the New Year and give our staff ample time to prepare comments and reports in advance of that public hearing. Thank you for your consideration of this request.

Sincerely

Elizabeth Taylor
Cape Cod Commission Subcommittee Chair

cc: Craig Olmstead, Vice President – Project Development, Energy Management, Inc, 75
Arlington Street, Suite 704, Boston, MA 02116.

Terry Orr, ESS Inc., 888 Worcester Street, Suite 240, Wellesley, MA 02482

Anne Canaday, EOEa – MEPA Unit, 100 Cambridge Street, Suite 900, Boston, MA 02114

Cape Cod Commission

3225 MAIN STREET

P.O.BOX 226

BARNSTABLE, MA 02630

(508) 362-3828

FAX (508) 362-3136

FAX TRANSMITTAL COVER SHEET

DATE: November 18, 2004

PAGES: 2

TO: Karen Adams

FAX: (978) 318-8303

FROM: Phil Dascombe, AICP
Planner

Tel: (508) 362-3828

Re: Cape Wind

Karen:

Please find attached a request for an extension to the comment period from the Cape Cod
Commission subcommittee.

Regards

Phil

**PLEASE CALL (508) 362-3828 IF YOU DO NOT RECEIVE ALL OF THE
SPECIFIED PAGES. THANK YOU.**

Carolyn Baker
P. O. Box 804
North Falmouth, MA 02556

207

November 17, 2004

Karen Adams
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Dear Ms. Adams:

Cape Wind has recently submitted an environmental impact report relating to the wind power plant construction proposed in Nantucket Sound. I respectfully request an extension of the comment and review period. I worked five years for a Cape Cod conservation commission. I have reviewed many impact statements and issued permits for construction of structures in land under the ocean. The 60-day comment period is inadequate for a project of this size.

I urge state and federal governments to appoint committees to study Cape Wind's proposal in depth. Government should really promulgate some guidelines before awarding this publicly owned ocean land to Cape Wind. A public comment period of at least six months is more appropriate and public hearings should be scheduled at least monthly. A year might be needed to review all aspects of this monumental project, including best and worst case scenarios.

Thank you very much for your consideration.

Sincerely,


Carolyn Baker

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NOV 19 2004
REGULATORY DIVISION

200

Monday, November 15, 2004

Lee Britton, Jr.
24 Highland Ave.
South Yarmouth, MA 02664

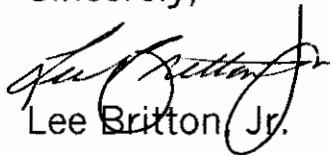
Karen Adams
US Army Corps of Engineers

Dear Ms. Adams,

As someone who was born and raised on the Cape I feel it is my right to voice an opinion on the wind farm. I am not pleased with the supposed impartiality of the review and I'd like to request that there be a 180 day comment period.

I feel the necessity for citing the farm here is nonexistent and that the reasons for NOT having it here are more than obvious. Thank you for your consideration of my view. By the way, I will be 52 tomorrow.

Sincerely,


Lee Britton, Jr.

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REGULATORY DIVISION

Christine Godfrey
Chief, Regulatory Division
ARMY CORPS OF ENGINEERS
N.E. District
696 Virginia Road
Concord, MA 01742

289

November 2004

Dear Ms. Godfrey,

Please immediately extend the public comment period on the Draft Environmental Impact Statement for the proposed Cape Wind project to 180 days. Any shorter time period is entirely insufficient to allow the public ample opportunity to provide input on such a lengthy and important document on a complex and controversial project.

Thank you for your prompt attention to this matter.

Sincerely,

Caroline H. Sharp

Caroline Sharp
P.O. Box 888
Edgartown, MA 02539

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NOV 18 2004
REGULATORY DIVISION

290

Ms. Christine Godfrey
Army Corps of Engineers
494 Virginia Rd.
Concord, Ma 01743

To Army Corp of Engineers,

Re. Cape Wind Project

My grandfather Henry B. Day and my
father Theodore A. Day and their families
have summered in Osterville and Uxbridge
for almost 100 years. We have sailed,
fished and raced on Nantucket Sound
continually every summer.
I urge you to attend the comment
period of the proposed Wind Farm
to 100 days to make sure it is
feasible and necessary.

Sincerely,
Frederic L. Day, Jr.

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NOV 18 2011

PLANNING DIVISION

Summer Residence from June-Oct 145 Broadway Osterville

Nov. 16, 2004

Joe Haver Adams
W. & Army Corps of Engineers
696 Virginia Ave.
Lancaster, MA 01972

291

Dear Mr. Adams,

I'm asking you to do what
you can to defend the public
interest period on the proposed
wind farm to at least 180 days.
Shift the proximity of the
proposal, it seems fair to ask
for that extension
The report by the Army Corps
of Engineers is long and complex.
The public deserves an
extension to the comment period
in order to absorb and digest
the report

Thank you for your
consideration.

Jonathan Haver
#6 Cedar Lane
Dorset, MA
02555

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NOV 19 2004
REGULATORY DIVISION

November 15, 2004



292

Ms. Karen Kirk Adams, EIS Project Manager
Cape Wind Energy Project
U. S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, MA 01742-2751

Dear Ms. Adams:

Reference: File Number NAE 2004-338-1

The Cape Cod Chamber of Commerce requests that the comment period on this project be extended until March 10, 2005.

The Chamber personnel have followed closely the applicant's public presentations and have been participating in the stakeholder sessions sponsored by the Massachusetts Technology Collaborative. We also plan to attend every public hearing that the U. S. Army Corps of Engineers sponsors.

Our membership, with the inclusion of our affiliate membership, numbers close to 4,000 businesses on Cape Cod. It is our intent to communicate with our membership an analysis which is objective and detailed.

This contemplated project will be the largest construction project in the area since the bridges were built over the Cape Cod Canal. It has the potential to impact this part of the country for a number of years.

The Draft EIS is extremely detailed and the content is complicated and it has far-reaching implications for the 240,000 year-round citizens of Barnstable County plus seasonal residents and the millions who visit us each year.

In our view 60 days over a busy holiday season is not adequate time for us to thoroughly review and comment on this extremely large body of work.

We believe the government owes it to the residents of Cape Cod to extend the comment period for this minimal amount of time, given the size of the project and the impact on our socio-economic existence.

We, therefore, formally request a total period of 180 days minimum for the comment period.

Sincerely,

A handwritten signature in dark ink, appearing to read "Wendy Northcross". The signature is fluid and cursive.

Wendy K. Northcross, CCE
CEO

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NOV 18 2004

U.S. ARMY CORPS OF ENGINEERS

November 18, 2004

Colonel Thomas L. Koning
District Engineer
U.S. Army Corp of Engineers
696 Virginia Road
Concord, MA 01742

293

Re: Cape Wind Energy Project
Action ID NAE-2004-338-1
Environmental Impact Report (EOEA File #12643)

Dear Colonel Koning:

In reviewing the findings in the Draft EIS/EIR/DRI section 5.16.3.6 under **Tourism and Recreation**, I noticed that the only towns listed in the view shed were Falmouth, Mashpee, Chatham, Harwich, Dennis, Yarmouth, Edgartown, & Oak Bluffs. It is my understanding that the towns in Barnstable including Osterville, Centerville, and Cotuit, as well as Woods Hole are also affected. Would the number of beachgoers estimated in the 100's of thousands be even higher due to the fact that the beaches affected in those towns weren't included as part of the view shed in this report?

I also found it interesting that the only studies cited in 5.16.4.6 under **Tourism and Recreation** were ones performed for the British Wind Energy Association or BWEA (A trade and professional body for the UK wind industry), and the Scottish Renewables Forum (A forum for Scotland's Renewable Energy Industry), titled "Tourist Attitudes towards Wind Farms". The Scottish Renewables mission statement on their website is for "the renewable energy industry supporting development and provision of sustainable energy for the future of Scotland". The BWEA's primary purpose as stated on their website is "to promote use of wind power in and around the UK both onshore and offshore". The BWEA also states on their website that they act as a central point for information for their membership and as a lobbying group to promote wind energy to government. The BWEA's slogan is "Championing the UK Wind Industry". I question how unbiased their surveys can be to determine if wind farms have an impact on tourism. It isn't their primary focus.

However, since Scotland was selected in the DEIS as an example, I ask that the survey conducted by VISITSCOTLAND which can be found on http://www.scotexchange.net/txtonly/know_your_market/kym-windfarm-report.htm be included in the DEIS comment review. VISITSCOTLAND is the "Official Site of Scotland's National Board of Tourism and has a much broader purpose which is "to bring together the many trade associations and bodies including corporate players in the tourism and hospitality industry in Scotland". Their key objectives are "to represent the

industry and tourism operators views to government and public agencies to **add value to investment and policy decisions which will contribute to Scotland's international competitiveness**".

Their complete report listed above is a 190 page detailed report. Their methodology was undertaken with visitors to Scotland during July 2002. The 6 Hall Tests were conducted in six different locations. Visitors who were simply asked to participate on a survey about visiting the Scottish countryside took a total of 180 in depth interviews. The specific subject matter of the research – wind farms- was not revealed when they were recruited. In addition quotas were set to ensure that there was a balance of staying visitors, vis a vis day trippers, overseas visitors, vis a vis Scots and UK visitors, and active countryside visitors. Almost half had actually experienced a wind farm in Scotland. The report was fair and unbiased and had pro's and con's for both wind farm proponents and opponents.

Arguments against the wind farm included impact on scenery. Thirty one (31) % said scenery and landscape would be spoiled by wind farm development. Seven (7) % described impact as awful/dreadful/appalling. Other responses were dependent on other factors including location (22%), whether or not turbines could be camouflaged (7%) or provided that there weren't too many turbines (4%).

On balance the responses tended to indicate that in terms of the number of turbines there was a preference for small-scale wind farm developments rather than large-scale developments. Three in ten claimed it was better on a small-scale; 13% said preferred not too many together.

Over half the respondents said that wind farms should be as far away as possible from view.

There were statements given that the interviewers had to agree or disagree with. Fifty-eight (58)% agreed with the statement "wind farms spoiled the look of the Scottish countryside". Fifty-five (55) % agreed with the statement "they would prefer to see 20 wind farm developments with 10 turbines rather than a single large development with 200 turbines". Sixty-five (65)% disagreed with the statement that "they had no strong opinions one way or the other on developments of wind farms". Only 15% agreed with the statement "using wind farms in the promotion of Scotland to tourists would provide appeal to visitors". Sixty-five (65)% disagreed with that statement. Sixty-two (62)% disagreed with the statement that "seeing a wind farm would add to their enjoyment of the Scottish countryside" and a whopping 74% disagreed with the statement "it would be an added attraction if wind farms were located in popular tourist areas.

In summary the conclusion and recommendations by VISITSCOTLAND stated that respondents were conditionally positive towards wind farms as a means of generating power. However, the "conditionally positive" was important in terms of wind farm development and it's impact on tourism. Only a small proportion of visitors were positive towards a wind farm development without any conditions. A large proportion was likely to qualify their responses with "it depends", "so long as", "provided that". Most of these

conditions were to the sighting of wind farms and recognition that most people see them as visually intrusive.

A common theme amongst both the trade and consumers was that wind farms should not be sighted in or near designated areas of outstanding scenery, National Parks, National Scenic Areas, Sites of Special Scientific Interest, etc. It was also the general consensus amongst visitors that wherever possible wind turbines should not be located in or near popular tourist areas. There was a preference not to see them at all.

There was a feeling that wind farms only have a novelty value at the moment for visitors because there aren't too many, and that there is a danger of cumulative development of wind farms.

This study was unbiased as research highlighted a mix of different messages and conditions related to wind farm development. The report suggested each case should be judged on it's own merits, rather than attempting to define an overall policy. It was VISITSCOTLAND's recommendation to devise a policy which was set within the overall context of the recognition of the importance of sustainable and renewable energies, but which would allow judgment on individual wind farm applications taking into account all the key factors and elements indicated above.

It is also interesting to note that the Scottish Natural Heritage, the Wales Tourist Board, the Moray Council, the Argil and Bute Council, the Dumfries and Galloway Council, the Council for Protection of Rural England, the Association for the Protection of Rural Scotland, the Council for Protection of Rural Wales, the Council for National Parks, the Ramblers Association, the Scottish Wildlife Trust, and the Mountaineering Council of Scotland all have issued statements or policies against wind farm developments within or affecting designated areas of outstanding scenery, National Parks, National Scenic Areas, Sites of Special Scientific Interest, Tourist Destinations, etc. Why weren't these policies mentioned in this section regarding Tourism and Recreation?

Lastly, I also found it interesting that the DEIS cited the (MORI, Scotland 2002) example in this statement. I actually read the report. In more detail it states that 3 in 5 or 60% of those surveyed weren't aware of any wind farms. My assumption would be that the wind farms were hence in a remote location and not in area where tourists visit. Of those 40% who knew they existed, 52% didn't know exactly where the wind farms were, again, verifying my assumption. Of the remaining percentage that knew where the wind farms were only 49% had seen them. This now dwindles the actual number of respondents down to 9% who actually saw the wind farms. It was then that over half said the wind farms had a positive effect. That is a measly 4.5% of respondents to the survey having a favorable statement. Surely, you can't state that the Cape Wind Project is in that a remote of a location!

I conclude with my analogy of a 5 star hotel. Anyone who makes a reservation at the hotel gets to use the same amenities, the pool, the spa, the shops, the concierge, the restaurants, and room service. Most usually have the same décor and room size. Why then do some pay \$100's more for a view? What happens when you reserve a standard room that overlooks the parking lot or the dumpsters? Do you call and ask if there is another room available? Are you at least disappointed? And recognize the hotel room is not usually the main purpose of your visit.

What is Cape Cod and Horseshoe Shoal in particular but the view?

I respectfully disagree with the findings in Sections 5.16.3.6 and 5.16.4.6. I question the validity of this report based on the fact that only those who have an agenda in promoting wind farm development have been heard.

Sincerely,

Mary Reardon
18 Robertson Road
Worcester, MA 01602



NOV 16 '04 294
E. ORLEANS
MA.
02643
PH. 1-508 255-6666

TO: KAREN ADAMS
U.S. ARMY CORPS OF ENGINEERS

I AM OPPOSED TO THE WIND FARM AT
THE PLANNED LOCATION.

I WOULD WISH TO HAVE THE MINIMUM 180
DAY COMMENT PERIOD.

(1) CAN ANY BUSINESS OR COMPANY GO
ANYWHERE ON THE U.S. COAST AND BUILD
A FOR PROFIT VENTURE? I WOULD HOPE NOT!

(2) POLLUTION. AIR - SEA - NOISE
VISUAL. ALL ABOVE. AESTHETICS ARE
IMPORTANT IN A VERY UNIQUE AREA. THIS
IS NOT THE MOUTAIN DESERT?
I THINK JUST THE BUILDING OF THE WIND
MACHINES WILL SERIOUSLY DISTURB THE SEA
FLOOR.
AND BIRDS. COME ON.... JUST ONE A DAY!
RESEARCH ON THIS....??

(3) COSTS - PROFITS.
THE TAXPAYER PAYS TWICE. FIRST, THE
SUBSIDY. THEN PAYING FOR THE ELECTRICITY.
AND THE BUILDING COSTS. ALWAYS LOW AT
FIRST GUESS. REMEMBER "THE BIG DIG."
... AND NOW ALL THE DANISH MACHINES ARE
BEING PULLED FOR EARLY MAINTENANCE AND
REPAIR.

THINK HARD ON THIS.

SINCERELY

Robert Burkert

CC: GOV. ROMNEY
SEN. E. KENNEDY
SEN. J. KERRY
CONGR. W. DELAHUNT

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November 18, 2004

295

Ms. Karen Kirk-Adams
Army Corps of Engineers
Cape Wind Energy
696 Virginia Road
Concord, MA
01742

Dear Ms. Kirk-Adams:

I feel proud to live in a state where people feel a sense of responsibility toward the problem of global warming despite a lack of support from Washington. I hope we can set an example for the rest of the country with this important project.

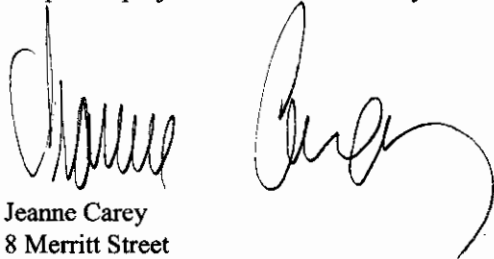
I believe climate change is the most serious problem the world has ever faced. Despite scientific predictions that it will cause catastrophic flooding of our coasts, extinction of species of animals and vegetation, the spread of disease and countless other problems, our administration chooses to deny that the problem even exists.

I travel to Europe for my work, and find myself constantly feeling I need to apologize for my country's lack of cooperation with other countries in working to solve this crisis. We shamelessly drive SUVs and crank up our air conditioners as if we believe that once we exhaust this planet we can move on to the next. I am embarrassed by the attitude we convey to the world.

Without inventing anything new, we have the wonderful opportunity to make significant progress toward a solution to global warming and reliance on Middle East oil with the clean and affordable technology of wind power. We need to build windmills soon and often.

Some may comment that it is easy for me to support the Cape Wind project since it is not in my back yard. I live in Marblehead, and I'll tell you what is in "my backyard"- the Salem "filthy five" coal burning plant. I'd trade it for windmills in a heartbeat. And probably live longer.

I hope this project can become a reality.



Jeanne Carey
8 Merritt Street
Marblehead MA
01945

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U.S. ARMY CORPS OF ENGINEERS

296

November 17, 2004

Karen K. Adams
Army Corps Of Engineers
696 Virginia Road
Concord, MA 01742

Dear Ms. Adams:

I would like to register my objection to the Army Corps of Engineers' review of Cape Wind Associate, LLC's, proposal to industrialize 24 square miles of Nantucket Sound.

The massive project Cape Wind proposes is the first offshore wind energy project this country has faced. Currently, there are no federal laws that authorize the occupation of outer continental shelf lands by private developers or that regulate how and where such development is appropriate.

The federal government must first establish guidelines for the review of proposals such as Cape Wind's before any more development takes place. We must develop sensible standards that enable the appropriate federal agency to weigh the benefits of a proposed project against its costs, which potentially include harmful environmental impacts, negative effects on the affected region's economy and degradation of an area's aesthetic values.

These public resources belong to all of us, and it is imperative that sensible laws be passed before any projects are approved. Wealthy private developers should not determine how or where the outer continental shelf will be developed. Without an established process by which the Army Corps of Engineers, or any other federal agency, can objectively and competently review these proposals, any consideration of Cape Wind's proposed wind plant should cease. Thank you for your consideration of this issue.

Sincerely,



Dale C. Edmunds
332 Walnut Street
Wellesley, MA 02481

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SOLDONCAPECOD
— .com

297

David Iseman, e-PRO, SRES®, MA Broker

703 Main Street Falmouth, MA 02540 Cape Cod, USA

Cell: (508) 524-4574 Fax: (508) 477-1255 David@SoldOnCapeCod.com

November 16, 2004

Ms. Christine Godfrey
Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Dear Ms. Godfrey,

My colleagues and I have been informed that The Army Corps of Engineers has issued the Draft Environmental Impact Statement on the Cape Wind project. We are of the understanding that the DEIS is largely based on technical data provided by Cape Wind's paid consultants. As a predictable result, the document is strongly biased toward Cape Wind.

In fairness to future generations, I request that opponents of the project be granted a 180 day period in which to review the Corps' findings.

Personally, I do not wish to gaze out at massive towers in the middle of one of our greatest natural resources and tourist attractions.

Thank you for your earnest consideration.

Yours truly,

David Iseman

David Iseman
e-PRO, SRES
DHI/dbm

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REGULATORY DIVISION



5th Infantry Corps
Camp 3174

298

November 18, 1944

Army Corps Engineers

Re. Cape Verde Project

Dear Sir:

I wish to express my
concern for the World Project
which I think should be
more fully looked into the
effects it will have on the
future development of future
similar projects. This seems
to be an quick matter to off-
shore with things at this
time. Large quantities of material
the amount of material to be kept

Sincerely yours

Edith L. Bueger

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299

November 15, 2004

Mr. R.M. Burton, Director
Department of the Interior
Minerals Management Service
1849 C Street, NW
Washington, DC 20240

Dear Mr. Burton:

Thank you for your response dated November 5, 2004 to my inquiry regarding the critically important question of whether the federal government will prevent private developers from appropriating public trust ocean property under the control of the United States on the basis of nothing more than a section 10 permit. I am sure the Secretary agrees that the federal estate should not be given away on such a basis and without adequate legal authority. I am writing to you because based upon your letter, it appears my initial inquiry may not have been clear.

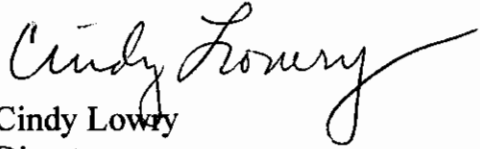
You responded to my letter by saying that the issue presented was involved in current litigation against the Corps of Engineers and therefore could not be answered. To the contrary, the question the Oceans Public Trust Initiative (OPTI) is seeking an answer to is very distinct from that case, which does not involve the Department of the Interior.

The issues in that case concern whether the corps has jurisdiction over the Outer Continental Shelf (OCS) and, if so, can it simply ignore the issue of property rights held, or not held, by the United States in such an area when considering such a permit.

OPTI's question is entirely different. The answer in no way depends upon the outcome of that case. OPTI would like to know whether the federal government will allow a private party who possesses nothing more than a section 10 permit to take control of the OCS for private gain. Based on the land management and OCS duties of the Department of the Interior, it seems clear

that your agency should be in a position to answer this important question. I hope this clarification assists in understanding our question, and OPTI looks forward to your response.

Very truly yours,

A handwritten signature in cursive script, reading "Cindy Lowry". The signature is fluid and extends to the right with a long, sweeping tail.

Cindy Lowry
Director

cc: Colonel Thomas Koning
Thomas Sansonetti

300

Karen Adams, Project Manager
Regulatory Division
ARMY CORPS OF ENGINEERS
696 Virginia Road
Concord, MA 01742

Date November 17, 2004

Dear Ms. Adams,

Please immediately extend the public comment period on the Draft Environmental Impact Statement for the proposed Cape Wind project to 180 days. Any shorter time period is entirely insufficient to allow the public ample opportunity to provide input on such a lengthy and important document on a complex and controversial project.

Thank you for your prompt attention to this matter.

Sincerely,

Annette P. Smith
6 Black Horse Lane
Edgemoor, MA 02539

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